OBJECTS & LIMITS OF OPERATIONS FOR CANCER

WATSON CHEYNE

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THE OBJECTS AND LIMITS OF OPERATIONS FOR CANCER

WITH SPECIAL REFERENCE TO CANCER OF THE BREAST, MOUTH AND THROAT, AND INTESTINAL TRACT.

BEING THE LETTSOMIAN LECTURES FOR 1896.

BY

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THE OBJECTS AND LIMITS OF OPERATIONS FOR CANCER.

LECTURE I.

Mr. President and Gentlemen,—In the first place, allow me to thank you for the high honour you have done me in selecting me as your Lettsomian Lecturer on this occasion. While your selection has done me great honour and given me much pleasure, it has also caused me great anxiety, more especially in the choice of a subject which would be of sufficient interest to the Fellows of this Society. For it seems to me that the great value of lectures of this kind is that they afford an opportunity, not so much of presenting original work as of reviewing the present standpoint of medical science in some particular department, of criticising the advances that have been made, of seeing what of these advances are good and what are of doubtful value, and thus of furnishing a basis for further work.

One of the departments in which there has been much activity of late years is in the treatment of cancerous diseases. The last few years have seen marked alterations in the older methods of operating in these cases, and also the introduction of operations in regions and of an extent formerly not thought of. Opinions differ very much at the present time as to the utility of many of these surgical procedures, and it is a matter of much interest and importance to consider the results which have been obtained, and to come to some definite conclusions as to their value. And it is with a view of trying to estimate the value of the work done in this department that I have decided to discuss in these lectures the objects which we should aim at, and the limits to which we may go in operating for cancerous diseases.

By cancer I mean the carcinomata, the essential feature of which is continuous and excessive growth of epithelium. Once this growth has commenced, nothing that we know of has any power to stop it. It invades the surrounding tissues, it spreads along the lymphatic vessels, or is carried by these vessels to the nearest lymphatic glands, it passes from one lymphatic gland, or one chain of lymphatic glands, to another, till it ultimately reaches the main lymphatic trunks, through which it enters the blood stream, and is deposited in distant organs and parts of the body. Deposited in these distant organs, it again grows, and the same cycle of events follows, or would follow, were it not that the patient soon succumbs from general poisoning as the result of absorption of materials elaborated at the seat of the disease, from interference with the vital functions owing to the presence of the growth in important organs, from repeated hæmorrhages due to erosion of blood vessels, and so on. Once this overgrowth of epithelium has begun, it goes on inexorably, unless we can arrest it, to the one fatal end.

There has been much controversy as to the source of the epithelial cells of cancer: some asserting that they can only arise from pre-existing epithelium, while others hold that they may be developed from other cells, such as connective tissue cells or the lymphatic endothelium; even at the present time pathologists are not absolutely in unison on this point. This may at first sight seem a matter of merely scientific interest, and not of any special importance for the purpose of these lectures, and yet on its decision rests the view which one holds about the curability of cancer and about the whole principles of practice. For if the cancer cells are derived from connective tissue cells or lymphatic endothelium, there seems no reason why the disease should not begin anywhere in the body; or, at any rate, why, having once begun, it should not recur in parts which have no relation to the primary growth or the lymphatic flow from it, and thus we could have no guide as to how much and what tissues should be removed at the time of an operation, and no certainty—even although all existing disease has been taken away—that it would not break out in connective tissues elsewhere. If, on the other hand, the cancer cells arise solely from epithelium, we know where they begin, we can trace their mode of spread, and we have a good indication as to what tissues and how much of the tissue ought to be removed if we

wish to prevent recurrence. This is really the histological side of the question as to the local or constitutional origin of cancer.

Förster and Virchow are those who are chiefly responsible for the view of the origin of the cancer cells from connective tissue. According to Virchow's view, it is the cells in the stroma which are the really growing parts of the tumour, and the so-called epithelial cells are only a transformation of these, and do not increase or take further part in the pathological process. He was led to adopt this view partly because he did not realise that the alveoli communicated with each other and with the surface, that, in fact, cancer was a tubular and not an alveolar structure, for being alveolar, it was not at all clear how the epithelium could get there from the surface; he also took up this view in part because he thought he could trace all sorts of intermediate gradations between the small cells in the stroma and the fully-formed, large, epithelial cells. This view was naturally widely taken up by Virchow's followers, and it was extended to the normal growth of epithelium on the surface of the body, it being asserted that there also we had to do, not with a multiplication of epithelial cells, but with a continued new formation of cells from the connective tissue beneath.

These views were very ably contested, and, in the opinion of most, completely refuted, by the classical work of Thiersch on 'Epithelial Cancer,' and subsequently by Waldeyer, who extended his ideas to cancer generally. Thiersch demonstrated, in the first instance, that the alveoli communicated with each other, that, in fact, they were sections of tubes and not cavities, as had been supposed by Virchow, and he further showed, in the case of the epitheliomata, that before the surface of the tumour was destroyed by ulceration, these tubes communicated with the superficial epithelium. He clearly demonstrated the direct growth downwards of the epithelial cells, and laid stress on the development of the epithelium in the embryo, and on the view elaborated by Remak and His, that epithelium could only be derived from the epi- or hypo-blastic layers and never from the meso-blast. I cannot here go into the arguments in support of these two views, and I need only say that those elaborated by Thiersch and Waldeyer have now been accepted by the great majority of authorities, viz., that cancer is essentially an overgrowth of epithelium.

One argument has been brought forward by the supporters of the connective tissue origin of cancer which may be mentioned, namely, the observation which has been occasionally made where epithcliomata commence in connection with ulcers. Sometimes, apparently, the tumour begins towards the middle of an ulcer, or, at any rate, away from the edge, at a part where it is assumed that epithelial cells are not present, and in these cases, therefore, it has been held that we have an instance of development from connective tissue. The force of this argument was, however, upset by Friedlænder, who showed that it was not uncommon to find epithelium on parts of ulcers away from the edge, the cells being present there either because the ulceration had not destroyed all the epithelial elements of the skin at that part, or because healing had partly occurred and then the scar had broken down again, leaving islands of epithelium; or again, because epithelial cells had been deposited on the surface of the granulations and grown there like Reverdin's grafts.

What it is which excites this overgrowth of epithelium and imparts to it its power of indefinite extension is a subject which has been much debated, and which is at the present time one of the main topics of discussion. When we remember that normal epithelium does not possess an indefinite power of multiplication, and that the growth of epithelium is very readily arrested by unfavourable circumstances, we can see how very powerful and remarkable this factor must be. For the epithelial cells have in some way or other acquired properties which enable them to grow like parasites, quite independently of the rest of the body and of the cause which started the growth.

One set of views ascribes the increased growth to a number of factors, especially causes which keep up irritation in the part for a long time. Such are injury, long-continued irritation, long-standing inflammatory conditions such as mastitis in breast cancer, increased physiological action, the menopause and suckling in the case of the breast, heredity, mental states, &c., but taking all these together they do not account for more than 25 per cent. or 30 per cent. of all the cases, some 70 per cent. to 75 per cent. of cancer cases remaining in which no history of any of the foregoing agencies can be obtained. It is, therefore, clear that none of them are essential causes of the disease, they can only be looked on as accessory factors, the true agent which leads to

this remarkable epithelial proliferation being evidently something different and still unknown.

It is not part of my programme to discuss the etiology of cancer further than may be necessary for the development of my subject, but I may very shortly refer to one or two of these accessory factors. The occurrence of carcinoma after a blow is occasionally alleged by patients with regard to cancer of the breast, but the frequency with which this history is given varies considerably according to different authors, and is in no case common. Thus Fischer only obtained it in 1·6 per cent., Schulthess in 3·8, Von Winiwarter and Oldekop in about 7 per cent., Löwenthal in 13·4 per cent., &c. Considering the great number of injuries which are sustained, and the minute proportion of cases in which cancer follows, injury is evidently a very minor factor, but it is possible that it may have some effect in starting the disease, for example, by leading to extravasation of blood and continued inflammation, thus weakening the tissues and predisposing them to the epithelial invasion. While few lay stress on the history of a single blow as a cause of cancer—a history, I suppose, most of us have met with—it is quite different with regard to repeated injuries, long-continued irritation, or long-continued inflammation. It is pointed out that cancer in the alimentary tract most commonly occurs where there is some narrowing or difficulty in the onward passage of the contents, such as at the commencement of the œsophagus, opposite the bifurcation of the trachea, at the lower end of the œsophagus, at the pylorus, at the ileo-cœcal valve, at the hepatic or splenic flexures of the colon, in the sigmoid region, in the rectum just above the prostate, &c., and it is assumed that as a result of frequent passage of contents the epithelium becomes irritated and begins to grow wildly. On the other hand, it may be asserted by those who hold the parasitic view that it is just at these parts that the parasite would rest and might take root; or again, that the frequent injuries to which these parts are subjected irritates them and thus predisposes them to infection. The best examples of cancer connected with irritation are the cases, by no means rare, of chimney-sweeps' cancer, and paraffin and tar workers' cancer. The former has been worked out especially by Mr. Butlin, and the latter by Professor Volkmann, and there seems no reason to doubt that there is a distinct relation between the occupation and the disease, though the rarity with which the disease occurs in paraffin

workers and chimney sweeps shows that the nature of the work, though it predisposes, is not, after all, a very potent cause.

Another very common example given is cancer of the lip as the result of smoking, but although most people who have cancer of the lip smoke, the proportion of cancer in smokers over non-smokers is probably not greater than the proportion of smoking and non-smoking males; besides, why does the upper lip practically always escape, although it is as much exposed as the lower? Clearly, some other factor must come into play. This is the more evident when the fact pointed out by Von Winiwarter is borne in mind, namely, that in countries where women smoke, they are not more liable to cancer of the lip than women in other countries; and again, cancer of the lip was common enough before America was discovered.

So impressed are some with the relationship between irritation and cancer, that they assert that a simple tumour may be transformed into a malignant tumour by repeated irritation, and this controversy has especially arisen with regard to intra-laryngeal operations. No satisfactory evidence, however, has been produced of such conversion, and it is not at all a probable occurrence in the way which is commonly believed. If, however, it should ultimately be proved that cancer is a parasitic disease, it would be quite intelligible that a breach of surface caused by repeated snaring or cauterising of a warty growth might open a point of entrance to the parasite into a part already predisposed.

If we study the clinical effects of irritation of epithelium, we find that the result does not resemble the luxurious growth seen in cancer, and that it stops as soon as the irritation ceases. Mere irritation does not permanently implant such a power of overgrowth on the epithelium as is the case in cancer. The most usual effect of continued irritation on the skin is seen in the formation of a callosity, and a callosity is by no means a favourite seat of cancer. A quantity of epithelium is no doubt produced, but this is done slowly; it ceases at once on removal of the irritation. Even when an epithelioma does occur in a part subject to irritation, it is generally only after many years, and that an irritation should go on for years and then of itself suddenly lead to the production of a cancer at one part of the irritated surface, is not easily conceivable. It must be that some new factor has come into play and produced the result. In other words, irritation

is not a primary cause of cancer, it can at most be a predisposing agent.

Long-standing inflammatory conditions are also looked upon as predisposing to cancer, and the best example of this is cancer of the extremities occurring in connection with old ulcers or scars, and undoubtedly a large proportion of cases of cancer of the extremities do arise under these circumstances.

Another instance of the influence of inflammatory conditions on the production of cancer on which most are agreed, is the relation of mastitis to cancer of the breast. The relative frequency of mastitis and cancer is variously given; thus Neuendorf puts it at 31 per cent., Schulthess, among patients who have had children, at 38 per cent., Winiwarter, also among patients who have had children, at 21 per cent., and Eichel at 23 per cent. Perhaps a fair average from all the reports is that about 20 per cent. of the cancer patients who have borne children, and much fewer of those who have not, have previously suffered from mastitis. These statistics are, however, of little value, because we do not know exactly the frequency of mastitis in child-bearing women (according to Winkel it is 6 per cent., a smaller proportion than that of mastitis to cancer), and, further, there are a good many cases recorded where the mastitis had affected one breast, but the cancer developed in the other, so that even the existence of mastitis in a cancerous patient, or rather in one about to become cancerous, did not lead to its development at that part. Here also, therefore, we can only have to do with a secondary and non-essential factor.

A second set of views deals more widely and scientifically with the question of the origin of cancer and with the source from which the epithelial cells derive their increased power of growth. One of these is Cohnheim's, according to which there are left during fœtal life remnants of imperfectly developed tissue which at a later period, sometimes no doubt as the result of injury, &c., take on renewed growth and form tumours. On this view, the great activity of the epithelium is not a newly acquired property, but is merely a re-awakening of the latent energy which was stored up in these cells during fœtal life. There are many objections to Cohnheim's theory, and while it explains congenital tumours and deep-seated epithelial growths, such as dermoid cysts, it is difficult to understand how it is that these little inclusions remain just where cancer develops.

Another view may, however, be taken, viz., that this energy is imparted to the cells in later life, either as the result of invasion by parasites, or of something analogous to the process of fertilisation.

It is not necessary for my purpose to enter into any discussion of the so-called cancer parasite. There are histological objections to it which cannot be lightly thrown aside, indeed there are many objections to the parasitic theory as a whole, which can only be overcome if we assume that we have to do with a very unusual form of parasite, and with one which acts in a very unusual manner. The ordinary bacteric parasites attack the connective tissues or blood, and always lead, when growing locally, to some form of inflammatory action. Inflammatory action certainly accompanies the spread of cancerous epithelium, but it is quite a secondary occurrence, and does not at all resemble the inflammations characteristic of bacterial diseases. In tubercle, no doubt, endothelial cells multiply, and large cells are formed, but although bacilli are growing in their interior, these cells do not acquire the power of indefinite spread which is characteristic of the cancer cells. I know of no bacterial disease in which only epithelium is attacked, or in which anything resembling the invasion of cancer cells is produced. Practically, the only example of parasitic invasion of epithelium definitely known is the coccidial disease of rabbits. Epithelium is here attacked, but with what result? There is no hypertrophy of the epithelial cells at all corresponding to cancer. A growth is formed in which there are papillary processes of connective tissue lined with epithelium, and there is also hypertrophy and multiplication of epithelial cells, but the essential feature is hypertrophy of connective tissue as the result of the irritation, followed by secondary growth of the epithelium, rather than a primary growth of epithelium pushing its way into the tissue. Further, if we look at the epithelial cells which are or have been inhabited by the coccidia, they present a far from healthy appearance; indeed, it is characteristic of cells inhabited by parasites that, unless where the parasite is going to the wall, the cells show degenerative changes, and do not present the characters of active and unlimited growth shown by cancer cells. Whether the disease be due at its commencement to a parasite or not, I cannot associate the mode of spread of the epithelial cells with the continued presence of parasites in their interior. The conditions are different from the ordinary parasitic diseases,

for there new cells are constantly being formed from fresh connective tissue cells, while in cancer the new cells are simply descendants of the one or more epithelial cells which originally acquired the power of rapid growth; and it is difficult to believe that these innumerable secondary epithelial cells have been inhabited by parasites and yet have retained this remarkable power of growth.

As opposed to the parasitic view it has been suggested, among others by Scleich, that the starting point of a tumour is an impregnation of a cell or cells similar to the impregnation of the ovum by the spermatozoon. As to the source of this impregnation, Scleich's idea appears to be that any cell subjected to marked mechanical, chemical, or other irritation may act like a sperm cell to the other cells in the neighbourhood, impregnating them and endowing them with exceptional powers of growth and thus leading to their multiplication in tumour form; and he further thinks that cells become liable to this fresh stimulus when their period of physiological activity is coming to an end, thus explaining the late appearance of cancer. To the manner in which Scleich works out this view, there are, I think, many objections, which I cannot go into here. But some such view, namely, that some external agency effects once and for all a change in the original epithelial cells, by means of which they become endowed with the power of indefinite growth, seems to me to meet the case better than any other. It is not necessary that it should be a process of fertilisation, or that the exciting agent should be the same for all tumours, and in the case of cancer it is possible, though hardly probable, that it may be a parasite; but if it be we could hardly suppose that the parasite went on growing or acting.

Attempts have been made to support the parasitic theory by the inoculation of portions of cancer on the lower animals, but although in a few instances it appears that a certain amount of growth has taken place, no true development of cancer has been obtained, and this is a result which cannot be a matter of surprise; indeed, if a development of cancer had been obtained, it would have proved nothing in favour of the parasitic theory, for as these experiments are ordinarily performed, there is no true inoculation. Portions of cancerous tissues are introduced into the subcutaneous tissues, or more often into the peritoneal cavity, and the result is

awaited, but it must be remembered that if there is a parasite, or if cancer is an infective disease at all, it is an infection of epithelium, and therefore it is the epithelium which should be inoculated, and not the subcutaneous tissue or peritoneum. If growth did occur as the result of the introduction of cancerous material into the deeper tissues, it would not imply any infection of the new individual, but simply a continued growth of the original cancer cells which were introduced. It is in fact rather surprising that more positive results have not been obtained by subcutaneous or inter-peritoneal inoculation of cancer, especially from animals of the same species, but it is probable that the epithelial cells die or lose their virulence before the part introduced has become properly adherent, or before a sufficient supply of nutriment has been furnished to keep it alive and active. The failure of the inoculation from one species to another is not so surprising, as the epithelium may not find a proper soil, and my experience in skin grafting rather tends to confirm this; I have found it very difficult indeed to graft large wounds on man with epithelium from the lower animals.

The only experiments which promise any definite result are those of the kind carried on by Mr. d'Arcy Power, where the cancerous material is introduced into an epithelial cavity such as the vagina and retained in contact with the epithelium, and where an opportunity is thus afforded for infection of the vaginal epithelium. Experiments of this kind have so far failed, although unfortunately for the efficacy of the cancer bodies, Mr. Power has seen them more than once in the vaginal epithelium in the animals so treated, without, however, any development of cancer. If they are parasites, that observation would show that they could live in the vaginal epithelium of guinea-pigs, but yet could not produce cancer. Similar inoculations have been made into the mammary glands; also without result.

I need not follow up this matter, but before leaving this question I should like to refer to examples of inoculation in man which have a very important clinical bearing.

Not only in experimental, but also in accidental and auto-inoculation, we must distinguish between *infection* and *implantation*. By *infection*, I mean a new outbreak of cancer as the result of the infection of fresh epithelium from a previous cancerous growth; by *implantation*, the direct implantation of cancer cells

from the original tumour and their development in a new place. It is very doubtful whether any of the cases which have occurred in man are examples of true infection. I know of no instance where, for example, a squamous epithelioma of the mouth or pharynx has been immediately followed by a colloid cancer of the stomach, or a cylindrical epithelioma of the intestinal tract; while cases are known where cancers have occurred in these parts secondary to cancer in the throat, but they have always been of the type of the original growth, and not of the type of the local epithelium. Thus Klebs found in three cases, according to Erbse, squamous epithelioma in the stomach after epithelioma of the mouth, and Israel had a similar case, where the secondary cancer occurred in the duodenum. A number of cases are on record where one part in constant contact with the cancerous part has developed a secondary cancer, one of the most frequent situations being in connection with the labia; but as in these cases the character of the epithelium is the same in the two places, we cannot say whether we have to do with infection or transplantation; however, the great rarity of the occurrence is against the former view. Kaufmann mentions a case of squamous epithelioma of the hand, followed by squamous epithelioma of the conjunctiva, in a patient who had epiphora and was constantly wiping his eye with his hand. Kraske found in one case a cylindrical epithelioma near the anus, at a part where the normal epithelium is squamous, secondary to cylindrical epithelioma higher up. Perhaps the most striking example is one narrated by Tross, where a woman had a glandular carcinoma of the uterus, and her husband developed a similar cancer on the penis. Had it been a case of infection it would have been a squamous epithelioma, the fact that it was not shows that we have here to do with implantation and not infection. This is also an interesting case as showing the inoculability of cancer from one individual to another, but it tells strongly against the parasitic origin of cancer, for there must have been even better facilities for the implantation of a parasitic than of the actual cancer cells, and yet we see that it was the latter and not the former which were transferred. I need not go into other cases, but in all it is evident that we have to do with implantation, and not with infection, because the secondary cancers had epithelium of the character of that of the primary epithelium, and not of the normal epithelium of the part. That cases like these should occur

is, of course, only what one would expect, for in the spread of cancer, implantation is constantly taking place from the primary tumour to the lymphatic glands and distant organs. The wonder is not that it does occur, but that it happens so seldom; and its rarity is a strong proof against the infectiveness of cancer, for in all these cases there is plenty of opportunity, in fact constant opportunity, for infection of epithelium, while the opportunities for transplantation on a free surface, namely, denudation of epithelium, possibility of rest, &c., are quite rare.

I may also mention two cases of my own which introduce the real point of practical importance in reference to this question of implantation. Some years ago I was removing a very extensive sarcoma of the lower jaw, floor of mouth, cheek, &c., and I found, after going on for some time, that it was advisable to perform tracheotomy and plug the trachea, and this I did during the course of the operation. Whether I used the knife with which I had been previously working or not, I did not observe at the time, and I could not afterwards ascertain, but when the patient recovered and everything had healed up, he came back with a sarcomatous nodule, deep in the scar of the tracheotomy wound, and though I removed it as freely as possible, it again recurred and ultimately killed him, the seat of the original operation remaining all the time quite free from disease.

Another equally disappointing result occurred to me some years ago in a case of epithelioma. I had removed the whole tongue for an extensive epithelioma, along with glands in the upper part of one anterior triangle. The mouth remained well, but the patient returned with rapid enlargement of the glands beneath the sterno-mastoid on both sides of the neck. As we all know, the very rapid enlargement of epitheliomatous glands means a cystic condition from degeneration of the rapidly growing cancer cells. In this instance I thought it worth while giving the patient another chance, and I did a most extensive operation on both sides of the neck, removing most of the structures of the neck. Unfortunately, on one side, while the mass was being taken away, the cyst burst, and the fluid, containing flakes of epithelium, poured into the wound. I washed and sponged it out as thoroughly as I could, but although the other side healed perfectly, that on which this accident happened became brawny and thick all over, in fact, there was a diffuse epitheliomatous infiltration of the whole wound,

and there can be no doubt that the groups of epithelial cells which escaped from the ruptured gland grew in the parts of the wound in which they were deposited. Several instances of this kind of infection have been noticed, cases, for example, where cancerous ascites have been punctured and cancer nodules have developed along the track of the canula, or again where the cheek has been split in order to gain access to cancer in the mouth, and where cancer nodules have afterwards developed in the stitch tracks in the cheek. There is also good reason for believing that other local recurrences, for example, after breast operations, may not unfrequently result from similar soiling of the wound. In the case of the breast, this would more especially apply to soiling as the result of cutting the breast away from the axillary glands and thus cutting across infected glands or lymphatic vessels. The great clinical importance of these facts is self-evident, and they show the necessity for removing cancerous tumours entire and not piecemeal, and for taking great care not to soil the wound with material from a cancerous growth.

Mode of spread.—At the very commencement of this lecture I referred to the mode in which cancer spreads, namely, chiefly along the lymphatic vessels, and this lymphatic spread occurs from a very early period of the disease. Indeed, I believe, that from the very earliest period the cancer cells are growing in lymph spaces, and that it is this which leads to the alveolar or tubular arrangement so characteristic of cancer, these alveoli not being newly formed cavities, but lymph spaces and vessels much dilated and altered by the growing epithelial cells in their interior. One interesting point in this connection is the varying malignancy of these growths. This may be due to various factors; for example, to the kind of epithelium involved, the larger cell forms, namely, the squamous cells, not being so readily carried along lymph channels as the smaller; the cylindrical form, which rapidly undergoes colloid degeneration, adhering more closely to the walls of the vessels, and perhaps not growing so readily, and so on. A good deal also depends on the situation of the tumour. For example, a tumour growing in muscle spreads much more rapidly than a tumour in the skin, and this is very readily seen by comparing the rapidity of growth of an epithelioma of the skin and an epithelioma of the tongue. In the latter case the cancerous growth very soon penetrates into the muscle, and the constant movements of the

muscle tend to force cancer cells rapidly along the lymph channels. Waldeyer, also, thinks that the varying malignancy has much to do with the normal activity of the epithelium first attacked, and this may explain the greater virulence of these growths in young persons. In part it may also be due to varying virulence in the supposititious fertilising agent of which I have already spoken. It is possible that the general state of the patient's health and the nutritive condition of the tissues may have an influence in favouring or retarding growth. Of these various points, however, the most important practical one is the situation of the tumour, especially the fact that where a tumour is situated in muscle it grows much more rapidly.

A question of great importance for our subject is that of the *local or constitutional origin* of cancer, and it will be already evident from the tenor of my remarks, that, so far as I am concerned, cancer is essentially a local disease. Formerly cancer was very generally regarded as a constitutional affection, and therefore cure by operation alone was looked on as hopeless, and medicaments of all kinds were poured into the unfortunate patients so as to expel the black bile, or whatever else was supposed to be the cause of the disease. Operation was looked upon simply as a means of prolonging life for a short time, of relieving the patient's mental anxiety, and of getting rid of certain local troubles, and not as a means of permanently freeing the patient from the disease. Indeed, the chief reasons formerly adduced in support of the constitutional origin were the rapid recurrence of the disease after operation and the increased rapidity of growth of these recurrences, and this was supposed to be due to the increased activity of the constitutional condition as a result of the local disturbance.

Of late, however, more especially since the microscope has revealed the character of the disease, the view of the local origin of cancer has been gaining ground, and surgeons for the most part now undertake these operations in the hope of curing the patient, and not merely of temporarily prolonging life. Recurrence in deeper tissues is no evidence in favour of the constitutional theory, for as epithelium only grows from epithelium, the fresh growth of a mass of epithelial cells in muscles, glands, connective tissues, &c., after an operation, cannot imply that we have to do with a constitutional disease which has broken out again, but

simply that all the epithelial invasion was not removed in the first instance. The fact that there are now many cases on record where patients have remained for a long time well after operation is also evidence in favour of the local origin of cancer. I shall presently refer to some statistics on this point, but I may here mention two remarkable examples showing the local nature of recurrences.

The most striking of these is a case of Gross's, of spindle-celled sarcoma of the breast (and the argument is the same here as for carcinoma), where after 22 operations, performed during the course of four years, and the removal of almost all the pectoral and intercostal muscles, the patient remained well and had no trace of recurrence nearly 11 years later; the only conclusion here being that at all previous operations portions of disease had been left behind, but that at length all had been rooted out. The other is a case narrated by Oldekop, where a cancer of the breast was removed in 1852 and a recurrence a few months later. Three years afterwards, the other breast was removed for cancer, and this was followed by rapid recurrence a month later and a fresh operation. The patient was well 23 years subsequently, having had no further trouble.

Is cancer curable? Theoretically, being a local disease and spreading in the way we have described, it should be quite curable in cases where it is possible to remove all the off-shoots from the primary nodule, and clinical evidence bears out this view. We know that if any visible portion of disease is left behind, recurrence takes place almost at once; and even when the disease left is invisible, recurrence takes place in the majority of cases within a year. The cases which recur later on are quite few in number, and after three years the chances of recurrence are so slight that most surgeons assume, following Volkmann, that a patient who shows no disease for three years after an operation may be looked on as cured, and they ascribe disease appearing locally at a later period to a fresh development and not to a residue of the old trouble. Cases, however, are sometimes met with in which late recurrence takes place in parts, such as in glands, where the cells must have remained dormant from the time of the previous operation. Not very long ago I assisted Sir Joseph Lister in operating on a case in which the breast had been removed for cancer about 15 years previously. At that time a few very small hard glands

were felt in the axilla, but were not touched. They remained in *statu quo* till a short time before the second operation, when they began to enlarge and were accordingly taken away. On examination they proved to be carcinomatous glands. While writing this paper I have seen a case in which the breast and axillary glands were removed nearly four years ago, and in which a small recurrence in the axilla has just been noticed, and Case 12, Table I, is apparently a similar example. In the list of pharynx cases to be dealt with in the following lectures, two will be found of Kocher's, where disease reappeared locally 10 and 12 years after the operation, but in these the question of a fresh development arises. Gross has gone very fully into this matter, and states that of all the recurrences after breast operations, at most 2·3 per cent. take place after three years; on the other hand, Konig gives a much larger proportion of late recurrences, placing it at about 15 per cent. in patients alive and well after three years. The facts also vary very much with the situation and kind of disease, and in the case of intestinal cancer late recurrences are by no means rare. Nevertheless, for all practical purposes, we may adopt the three-year limit, and may feel sure that when a patient, especially with breast or throat cancer, has passed that limit safely the great probability is that he will have no further trouble.

If we take cases of disease in parts where it is in the first instance superficial, and where there is plenty of room for cutting wide of it, we find a large number which remain free from recurrence for many years. I may instance, especially, epithelioma affecting the extremities. There the disease is superficial in the first instance, the epithelial cells are apparently not so readily, or, at any rate, not so early, carried along the lymphatic vessels, as in cases where muscles are affected, or where the cancer cells are smaller, as in the breast. The glands are readily accessible, and one can get well beyond the disease by amputation, and in amputating well above the part, the local disease is thoroughly and widely removed. Statistics of the results of cancer of the extremities are given by various authors and are very favourable. Thus, to mention only one, R. Volkmann, in his papers on this subject, in Volkmann's 'Klinische Vorträge,' gives the cures as 51 per cent., and the recurrences as 35 per cent.

Another very favourite seat of cancer is in the face, and there, also, we have probably all had cases where free removal of the

disease has apparently cured the patient. The least favourable of the face cancers is that of the lip, no doubt because the muscle is soon attacked, but, even here, the results strongly support the view of the curability of the disease. Thus Worner brings forward a large number of cases, 277 operations, which had occurred in Von Bruns's clinique, during a period of 41 years. Of these, 106, or 38·2 per cent., remained well for more than three years, and in 54, which also remained well, the three-year limit had not yet been reached. The recurrences were 36 per cent.; 21 of the patients had remained well for periods varying from 10 to 40 years. Maiweg gives the results at Bonn of 182 patients, and of these, 81 had remained free from recurrence for from 3 to 18 years, giving the percentage of cures at about 44 per cent.; in 49 of these cases, more than six years had elapsed; in addition to this number there were also 44 who were free from recurrence, but who had not yet reached the three-year limit. It is also an encouraging point with regard to these cases, that in several of those ultimately cured, one or more operations for recurrence had been carried out soon after the first operation. Thus, in the 81 cured cases in Maiweg's list, nine had had recurrences, one of them thrice, one twice, and the rest once. Taking the results of a large number of surgeons together, namely, Thierseh, Billroth, V. Bergmann, V. Winiwarter, Fischer, Koch, Partsch, and Bruns, the proportion of cases of cancer of the lip well three years after operation is 28·1 per cent.

Take, again, uterine cancer. Hoffmeier gives the cases of cancer of the portio vaginalis and cervix uteri, operated on in Schröder's clinique, and of these, 42 per cent. remained well after three years, and 41·3 per cent. after four years, the operation being, in most of them, high amputation of the cervix. In Martin's statistics of total extirpation of the uterus for all forms of cancer, 45·7 per cent. remained well after three years. Of these, 10 were cases of cancer of the body of the uterus, and recurrence only took place in one. In both of these reports, however, we probably have to do with carefully selected cases, and do not thus get a true view of the probabilities of cure.

I shall presently bring forward evidence as regards cancer of the breast, showing that with increased care in performing the primary operation, there is a diminished number of cases in which recurrence takes place, a fact strongly in support of the curability

of the disease. Whether this prolongation of life is to be considered as cure or not—and for my own part I do not see what other name to give it—certain it is that a marked prolongation of life, and not merely the addition of at least a few months, as was the case when the operation was performed on the old lines, is the result of wide and thorough removal of the disease in the first instance.

Let us pass on now to the subject proper of these lectures, namely, the *objects and limits of operation* in cases of this disease. The primary object of operation in cancer is, of course, the prolongation of the patient's life and the alleviation of his local trouble, and what I propose to assert in these lectures is that these results are in most cases best attained by aiming, wherever it is possible, at the *cure* of the disease. Up till quite recently, and even now, many surgeons approach operation in these cases impressed with the view that real cure is practically hopeless, and that, with few rare exceptions, the most that can be expected is prolongation of life for a variable length of time. They therefore oppose elaborate and extensive operations, which in themselves must involve considerable risk to life, and are content with fairly free removal of noticeable disease; in some cases, indeed, they do not even go so far. For example, in cases of mammary cancer, even where some enlarged glands are to be felt in the axilla, they comfort themselves with the idea that the glands may only be enlarged from irritation and not from cancerous deposit, and therefore leave them alone until their true cancerous nature is only too evident. Of course, if operations are performed in this manner, and with these views, it is no wonder that these surgeons are confirmed in their views, and go on operating on cancer with the sole object of prolonging life for a comparatively short time.

In discussing the curability of the disease, I have already mentioned evidence as regards cancer of the extremities, lips, and uterus, which shows that a real cure is obtainable in a very considerable proportion of cases, and in the following lectures I shall try to produce similar evidence as regards other parts. I therefore hold, and would strongly urge the view that the first question to be kept before us in investigating a case of cancer is whether there is any possibility of curing the disease or not. Such a point of view makes a very great difference in the operation, for it is not then sufficient to remove only the noticeable disease, but it is

necessary to take away, as far as possible, the parts in which disease may have become disseminated, although still unrecognisable, in other words, possibly infected lymphatic areas. Thus, if the skin is affected, a considerable portion around must be taken away, and this is the more necessary where the infection of the skin has come from beneath, as, for example, where cancers of the breast reach the surface, for the dissemination in the cutaneous lymphatic plexus is often, under these circumstances, very rapid and extensive, and this is probably due in part to the larger size of the deep cutaneous plexus, which will, in the latter case, be first involved. Again, where muscle is infected, the cancer cells are very rapidly and early driven along the lymphatic vessels of the muscle, and even though there may only be one visible nodule in the muscle, the whole or the greater part of it must be looked on as suspicious, and must be removed, if there is to be anything like certainty in attaining the object of the operation, namely, the patient's cure. Again, as regards the lymphatic glands, we know that from a very early period they become affected, and that, of course, without any visible enlargement in the first instance, and in addition to this infection of the glands without enlargement, plugs of cancer cells very often stick in the lymphatic vessels on their way to the glands. Hence it is necessary in all cases, at any rate in the breast, where the disease has lasted any time, or extended at all deeply, not only to remove the primary mass freely, but also to take away the whole lymphatic area up to and including the nearest lymphatic glands. Thus, the operation performed with the object of curing the disease becomes a much more extensive one, and consequently much more serious than that which simply aims at getting rid of the main trouble for a time, and prolonging the patient's life.

The first question to be considered then, with regard to a case of cancer, is the anatomical one, namely, whether it is anatomically possible to remove all the local disease and the probably infected lymphatic area so thoroughly as to give a fair chance of non-recurrence. If this is anatomically possible, the next questions are what are the chances of death as the result of the operation, and what will be the subsequent functional result? In considering these questions we must remember that we are dealing with an otherwise incurable disease, one which is comparatively rapidly fatal, and one which in certain regions, for example the

throat, is often the cause of very extreme suffering before death supervenes, and, therefore, even although the risks are very great, unless the result of the operation is very fatal, the question of operation ought to be presented to the patient if there is a reasonable chance of removing the disease. There is, at the present time, a tendency with some surgeons to careful selection of cancer cases for operation, that is to say, only to operate on quite simple cases. This is not, I think, a proper point of view. No doubt it is the way to get good statistics, but what of the poor patients who are not operated on because the prospect of success is not good? I do not think that patients should be refused operation unless the disease cannot be removed, unless early recurrence is very highly probable, or unless operation means almost certain death, or yields a hopeless functional result. Of course, if one has something better to substitute for the radical operation, such as colotomy in extensive rectal cancer, the matter is quite different, but where this is not the case, the patient should be told all the circumstances, and allowed to take his choice.

The position which one ought to take up as adviser of the patient is, I admit, in some of these cases, a very difficult one. The following are the lines which I myself go upon. If there is no especial danger in the operation, and the chances of cure are good, as in the case of an ordinary breast cancer, then I should urge the operation, and should not enter into any such details with regard to it or the disease as might frighten the patient. Where the operation is more severe and the probable result is not so good, as, for example, in a breast case with marked adhesion to the muscle, I do not urge the operation, but I tell the patient that I think it is still worth while taking the chance, and I also point out that there is likely to be a good deal of inconvenience after the operation in the way of interference with the movement of the arm; such a patient will usually decide to have the operation done. Where the immediate danger of the operation is very great, as in the throat cases, which I shall mention in the next lecture, but where it still seems anatomically possible to take away the whole disease, the decision must, I think, be left entirely to the patient. The dangers of the operation and the risks of recurrence must be fully pointed out, as well as the subsequent functional results, and the patient must be left to decide. The position which I have assumed in these cases is this,

that after emphasizing the dangers of the operation and laying the whole matter before the patient in its worst light, I have said that if he wishes to avail himself of the chance, I am willing to perform the operation. The majority of such patients, when they know the facts of the case, prefer to make the best they can of what period of life remains to them, while some, on the other hand, decide to have the operation performed, and a certain proportion of these, small, it is true, reap their reward in marked prolongation of life, or even in permanent freedom from the disease.

The primary object of operation in these cases being therefore cure, the limits of the radical operation are where there is no reasonable prospect of removing the whole disease, or where, along with a very poor prospect of success, there is a very high mortality from the attempt. In such cases I do not think that operation should be mentioned at all, for even where the patient recovers from it, and has presumably two or three months added to his life, few would, I think, thank one for it, seeing that these two or three months have been spent in convalescing from a serious and, in the end, useless operation.

But even in cases where hope of cure or marked prolongation of life by a radical operation are out of the question, operation may sometimes be advisable with the object of removing symptoms which are immediately threatening to life, such operations, for example, as tracheotomy, colotomy, &c., or, in the second place, with the object of taking away the primary disease from a part, such as the mouth or throat, where its continued development means intense pain and trouble, and thus of substituting for these troubles an easier death from exhaustion. A *sine quâ non* of such operations must, however, be that they are reasonably free from immediate risk, and with regard to the second class, that there is a fair prospect of attaining the object of the operation, namely, the entire removal of the disease from the part operated on. I do not think that a dangerous operation is allowable for simple relief of symptoms, however proper it may be if a cure may be hoped for.

There are thus two different objects to be held in view, and two different questions as regards operation which we must bear in mind in treating a case of cancer, namely, (i) can we reasonably hope for a cure? for if we can, a serious or dangerous operation

is permissible; or (ii) cure not being possible, can we decidedly ameliorate the patient's condition by operation, such operation, however, not involving any great risk to life?

It is, of course, impossible for me, in the time at my disposal, to discuss the objects and limits of operation for cancer in all parts of the body, and I have therefore selected three regions for examination, namely, (1) the breast, (2) the throat, and (3) the intestinal tract, as these three regions illustrate very well all the points bearing on our subject.

(1) *Cancer of the Breast.*—The female breast is one of the most common seats of cancerous disease, and great attention has consequently been paid to cancer in this region, but it is only recently that any important advance has taken place. When I was attending classes on surgery 24 years ago, the teaching which I received, except from Sir Joseph Lister, as regards the method of operation, was simply to remove the breast in these cases by an elliptical incision including the nipple. After the operation the side of the chest was not flat; on the contrary, one could see a certain amount of fulness all round the scar, showing that not only were outlying lobules of the breast left behind, but, also, that merely the central portion had been removed. Further, the pectoral fascia was not taken away; indeed, it was held that on no account must it be touched, because otherwise the suppuration which was apt to follow might be extremely dangerous; and, lastly, only rarely, and with the greatest hesitation, were one or two glands excised from the axilla. As antiseptic surgery began to exercise its influence, and as it became evident that the extent of the operation did not increase the risk of septic disease, the tendency was towards more extensive operations, and in this, as in many other departments of surgery, Sir Joseph Lister took the lead, and began to extend the area of operation, especially in the way of more extensive, and finally of more or less complete removal of the axillary contents and of the pectoral fascia. It was not, however, till the researches of Heidenhain, and subsequently of Stiles and others in this country, that we knew exactly how the disease extended, or, indeed, how extensive the mammary gland itself was. As the result of these researches, we now know that by the older methods of operating, and indeed by any method which does not take proper cognisance of the

facts which these recent researches have brought to light, the patient never really has a chance of cure, properly speaking, and the wonder is not that recurrence so constantly takes place, but that in any cases (and this was the result in some) apparent cure follows.

Where a cancer returns after an operation, it, of course, means that the operation has not been sufficiently extensive to take away all the previously-existing disease, and it is only what one would expect that with imperfect removal the likelihood of recurrence should be very great. Of course, one cannot remove the internal metastatic deposits, and they may be, and often are, present at the time of the operation without having as yet given rise to any symptoms; but, on the other hand, the local return must be looked upon as the fault of the surgeon in not taking away enough of the tissue. No doubt in many cases this is a fault which is quite unavoidable, owing to the excessive and undiscoverable dissemination of the disease, but improvement in the results can only take place if we put the blame of the local recurrence on the operator, for just as we must assume at the present day that suppuration, or the occurrence of septic disease, after an operation through unbroken skin is entirely the fault of the surgeon, so it must be admitted, though not by any means to such an extreme extent, that a recurrence in the track of an operation wound, or in the neighbouring glands, also implies an imperfect operation.

Method of Operation.—Before going on to discuss the results of operation for cancer of the breast, I must very shortly indicate the sort of procedure which I think is necessary, and as I have already written on this subject, I need not go at all fully into details. Bearing in mind the very early period at which the cancer cells get into the lymphatic vessels, an operation to be at all complete must include the primary disease, the lymph channels leading from it, and the whole mass of the nearest lymphatic glands. It does not, however, follow that when these glands are enlarged it is absolutely necessary to go beyond the first group, because, for a time, at any rate, the disease seems to be held back at that point; but, as I say, the minimum operation for cancer of the breast, which will offer anything like a real chance of cure, must take away everything up to and including the first chain of glands. Hence, in the case of the breast, we must remove the primary disease, the whole breast, the tissue in which the lymphatics run from the

breast to the axilla, and the whole of the axillary glands. In this connection we must remember that recent researches have shown that the breast is a very much more extensive organ than was formerly supposed, and that by the old method of operating practically only the central part was taken away. Lobules of the breast run in the fat over the pectoral muscle nearly up to the clavicle, well into the axillary line, almost on to the sternum, and downwards on to the origin of the abdominal muscles. In the deeper part, also, the lobules of the breast are intimately connected with the pectoral fascia, and the removal of the breast without simultaneous thorough removal of the pectoral fascia inevitably means that numerous lobules are left behind. Hence our skin incisions must be very much more free than was formerly the rule, and, for my own part, I always take away the skin co-extensive with the prominent part of the organ. There is another reason for taking away this large amount of skin, namely, the existence of the suspensory ligaments of the breast, in which lymphatic vessels run from the organ to the skin, and these are not at all unfrequently infected with cancer cells. In addition to this portion absolutely taken away, the skin all around must be raised, leaving fat and lobules of the breast, as high as the clavicle, as far inwards as the middle of the sternum, downwards on to the abdominal muscles and outwards on to the latissimus dorsi, and one advantage of this free undermining of the skin is that in the great majority of cases one can subsequently bring the edges together by means of stitches. Where the tumour is situated towards one side of the breast, additional portions of skin must be taken away in a "V"-shaped manner, so that all the skin from the vicinity of the disease is removed. The skin flaps being held up, the pectoral muscle must be exposed at the upper part, and then, in order to ensure the removal of the fascia, a layer of the whole surface of the muscle must be taken away, and when the lower and outer edge of the pectoral muscle is reached, the fascia over the serratus magnus and the whole fatty tissue containing lymphatics, as far back as the edge of the latissimus dorsi, must be detached. In this way the primary disease, the breast, and the lymphatic vessels running in the fat and pectoral fascia towards the axilla are separated, and then one proceeds to clear out the whole contents of the axilla, finally leaving the nerves and vessels thoroughly cleaned as in an anatomical dissection.

One first follows the fat and fascia running between the pectoralis major and minor on to the costo-coracoid membrane, and then I expose the axillary vein at the lower part and tear open its sheath in its whole length. Then, raising the pectoralis minor, I begin at the very apex of the axilla, right up under the clavicle, and with a curved blunt instrument (the one I find most useful is a periosteum detacher, invented by Dr. Greville MacDonald for operations on the navel septum) and the finger detach the whole fat and included glands and lymphatic vessels, till everything except the important structures in the axilla has been got away. It is very important also that the whole tissue should be removed in one piece: in the first place, it is of great advantage in clearing the axilla to have the parts dragged down by the weight of the breast; and in the second place, it is very important not to cut through tissue which may be actually diseased, and which may lead to subsequent infection of the wound, as might be the case were the mamma taken away in the first instance and the axillary tissues removed subsequently. And this risk of soiling of the wound, as has been previously shown, is no imaginary one.

This operation is, in my opinion, the least extensive which ought to be done, even in a simple case, if the object is to cure the patient, but it must be modified and extended in most instances according to circumstances. Where the skin is much tacked down over the tumour, although it may not be actually involved in the disease, the cutaneous lymphatic vessels and those running in the suspensory ligaments are apt to be affected over a wide area, and hence it is necessary in such cases to cut exceptionally wide of the disease. Where the tumour itself actually involves the skin, however, we know that the disease has almost certainly spread widely in the cutaneous lymphatic plexus, and in such a case one must not hesitate to remove the skin extremely freely, and to leave a wound the edges of which it may not be possible to bring together. If such a wound is left it can very readily be closed by skin grafting, either at the time of the original operation, or, if the patient is too exhausted, about ten days or a fortnight afterwards.

Where the tumour is adherent to the pectoral fascia, as is very commonly the case, I think it is advisable to take away the whole thickness of the muscle at that part, and as the lymph tends to be forced onwards in the direction of the muscular fibres, the

mass of muscle removed should be detached along its whole length, from its origin to its insertion. In operating on such cases, as I approach the neighbourhood of the tumour, I usually sink my hand through the muscle, and then rapidly separate the part grasped from origin to insertion, and detach it at both ends; and, as a matter of fact, in many of my cases I have done this, and have thus removed a considerable part of the lower portion of the pectoral muscle. Halsted and others advise that the pectoral muscle—at any rate, its sternal origin—should be taken away in every case, partly in order to get thoroughly rid of the pectoral fascia, and partly in order to be able to clear out the axilla more effectually. As will be evident when I come to compare my statistics with Halsted's, this is really not necessary unless there are actual nodules in the substance of the muscle; more especially where the lower portion of the muscle is removed in the manner I have described, there is no difficulty whatever in pulling up the remains of the pectoral muscle sufficiently to obtain complete access to the upper part of the axilla.

Where the muscle itself is actually diseased, that is to say, where there are one or more nodules in the muscular substance, it has been pointed out by Heidenhain that the whole muscle must be looked on as infected, for the muscular contractions very quickly distribute the contents of the lymphatic vessels over it. He, therefore, advises complete removal of the pectoralis major under these circumstances. I am inclined to think, however, that even in these cases it is often sufficient to take away the sternal origin of the muscle, and that the clavicular portion may be left unless there is actual disease present in it. The connection between the two portions is not very intimate, and from a functional point of view it is of great importance to leave the clavicular part.

Where the glands in the axilla are markedly enlarged, the question arises as to how far one should go. In the first place, under such circumstances, it is certainly well to see what one is doing, and while, if the pectoral muscle is not affected at all, I prefer leaving it, I think it is well to divide it transversely, and after the operation stitch it up. The chief question, however, which has to be considered is whether, having found the higher axillary glands enlarged, one ought not to go further and remove the glands from the posterior triangle of the neck. Some have indeed tried to make it a universal rule that if the axillary glands

are at all enlarged, those in the posterior triangle must also be taken away; but, as I have already said, the first chain of glands opposes a barrier for a considerable time against the onward spread of the disease, and if only it is thoroughly removed, I think one may in most cases be content. Where the cancer is a slow growing one, and only the lower axillary glands are noticeably enlarged, I do not therefore open up the posterior triangle of the neck, and so far as I can recall, I have only twice had recurrence in the supra-clavicular glands. If, however, the highest axillary glands are noticeably affected, it stands to reason that the posterior triangle of the neck should be opened. Unfortunately, however, in these cases the line of infection does not so much run into the posterior triangle as along the subclavian vein into the thorax along a route that is only imperfectly accessible even when the posterior triangle is opened, and I have not seen much benefit in the way of finding and rooting out disease as the result of opening up that triangle. Mr. Arbuthnot Lane advocates division of the clavicle and clearing out the supra-clavicular glands in many cases, but this is a method which I cannot at all agree with, and I think that my results bear me out; and where the disease is noticeable in the supra-clavicular glands, I believe that cure is hopeless. Some have also advocated amputation at the shoulder joint with the view of removing the axillary disease still more thoroughly, and this was first done by Sir Joseph Lister, partly at my own instigation. I do not, however, believe that when the disease has gone so far as to necessitate such a procedure, there is the slightest probability of curing the patient. The conditions under which amputation of the arm would be necessary are the presence of a large mass in the axilla involving the nerves, for involvement of the vein or the artery, or even of both, does not necessitate amputation. I have on more than one occasion removed portions of the axillary vein to which glands were firmly adherent, and in one case I removed both vein and artery without any loss of vitality or other trouble in the limb; but where the disease is so diffuse as to involve the nerves, I think it may be taken as certain that it has extended beyond reach.

As regards the limits of operation for cure in breast cancer, therefore, I would exclude from operation (i) cases of cancer *en cuirasse;* (ii) cases where there is a large mass in the axilla involving the nerves; (iii) cases where large glands can be felt

above the clavicle; and (iv) all cases where secondary cancers already exist elsewhere. In none of these instances is there any reasonable prospect of cure; and there will be but little to be gained by subjecting the patient to the elaborate operations to which I have referred. Short of these conditions, however, I think a patient ought to have the chance of operation, and though, as I have said before, I would not urge it in bad cases, I think she should be allowed to choose. Even where the operation fails to cure, the prolongation of life is often marked, much more so after these thorough operations than after the ordinary imperfect procedure. In this list I have not included cancerous cachexia, as is usually done, because it seems to be due to absorption of products from the cancerous growth, and does not necessarily imply a general internal infection. I have repeatedly seen patients with marked cancerous cachexia improve immensely after the operation.

Results.—In considering the results of former and recent methods of operation for cancer of the breast, we may look either at the question of cure or at that of local recurrence, and the most satisfactory conclusion is, I think, obtained when we take both together; indeed, since the most recent views have influenced practice, the time is too short for the accumulation of any large statistics as regards cure, and one must therefore judge of the effect to some extent by considering the question of recurrence.

As regards cure, I have adopted Volkmann's three-year limit, and include under cures all cases which for a period of three years or longer after the operation have had no local recurrence, and have shown no sign of internal cancer. Although this three-year period is, as I have already said, not absolutely accurate, for a certain though small proportion of patients who have been alive and well at the end of three years have yet died of cancer, nevertheless, it is near enough for all practical purposes; and even if we only secured the patient three years of complete freedom from disease, such a gain would fully justify the most radical operation.

As regards the question of local recurrence, it will be seen that a very marked change has been produced by recent methods of operating. Formerly, and even now, local recurrence was extremely frequent (Gross puts it at 68·8 per cent., and that is not including the cases which have been lost sight of, probably many of which have also recurred). In considering this question of

local recurrence, it must also be remembered that up till recently half of these local recurrences took place during the first three months after the operation, and over 80 per cent. during the first year. Halsted has drawn a distinction between what he terms local recurrence and regional recurrence. By local recurrence he means recurrence actually in the track or area of the wound; by regional recurrence he implies recurrence in the neighbourhood, or in glandular areas which were not included in the first operation. Such a distinction is, however, extremely difficult to carry out, and it must often be impossible to determine whether a particular nodule has appeared in the track of the former operation or in its immediate vicinity. As a matter of fact, Halsted's regional recurrences imply an imperfect operation just as much as his local recurrences do; they simply mean that the operation has not been sufficiently extensive, no doubt in many cases because it was impossible. Hence, I prefer to group both these so-called local and regional recurrences together under the heading of external recurrences, and in my own statistics I speak of two sets of recurrences, namely, external recurrences in the wound, its vicinity, or the glands, and internal or metastatic deposits.

Cases of cure of cancer of the breast by operation were very rare in former times, and even at the present moment it is with many not so much a question of cure as one of prolongation of life: if cure happens to take place, it is a lucky and more or less unexpected result. The prolongation of life by the old operation is variously estimated at from 8 to 13 months, but this is really longer than it should be by reason of the fact that some of the patients have lived several years and have thus raised the average. Excluding cases which have passed beyond the three-year limit, I do not think that the prolongation of life by the old imperfect operation is on an average more than from six to eight months, though at the present time, where recurrence takes place after the more thorough operation, this prolongation seems to be considerably increased.

In looking back over old literature one is very much struck by the great rarity of cure, and the very desponding view which surgeons took of the chances of permanent freedom after operation. Velpeau only knew of 20 cases which had been cured, and it is by no means certain that all of these were cases of cancer. Many of the older surgeons state that they have not known a single

instance of cure. According to Henry, Benedikt of Breslau only operated eight times in 18 years, and during the last 17 years he did not operate on breast cancer at all; he considered, from his own experience and that of others, that the chance of cure was so extremely remote that he was not justified in subjecting the patients to the risks of the operation, which were at that time considerable. Von Winiwarter, in publishing in 1878 Billroth's results, viz., eight cures in 143 cases, says that this result is surprisingly good, and that no such favourable statistics had up to that time been published.

I need not recapitulate here the details with regard to various statistics, but I have in the second Table put together results which I have worked out from papers published from various cliniques; and in the first Table I publish all the cases on which I have myself operated since the beginning of 1890, at which time I obtained beds at the hospital and began to operate in this thorough manner. I would lay stress on the fact that my cases have been in no way selected, only cases of the kind previously referred to having been refused operation. Many of them were very advanced, and would have been refused operation by those who select their cases; and I may add, that in all of them I have found disease in the axillary glands. I may say, also, that all my cases were subjected to microscropical examination, so that there is no question as to the diagnosis in these instances.

With regard to the various statistics which have been published, there is one very curious fallacy which has cost me a great deal of time and trouble to rectify in preparing the second Table, and it is this—the total number of cases operated upon is given, and the cures have been calculated in reference to the total number, quite irrespective of the fact that in some the operations had been quite recently done. For example, taking the first line we have the total number of cases given as 147, and the cures as 8 per cent., but then a very considerable proportion of these cases had been operated on within three years of the publication of the statistics, and none of these could, by any possibility, have lived three years. It is necessary, therefore, in order to study the results of cure according to the three-year limit, to exclude all those cases in which the operation was done within three years of the publication of the report. Thus, in the first line we have to exclude no less than 61 cases, and when the number of cures

is reckoned in proportion to the remaining 86 cases, we have the percentage at once raised from 8 to 15 per cent. Some exclude the deaths and the cases lost sight of, but as regards the deaths I do not think that this is fair, more especially as in former times the deaths were excessive. Their exclusion would make it appear that an individual patient has a much better chance of cure than is really the case. As to the cases lost sight of, I do not think that they ought to be excluded, because it is highly probable—certainly from my own experience—that most of the cases of operations on cancer which are lost sight of either die or recur, and if they recur, knowing that the disease is cancer, the patients either decline to consider a second operation, or believe that a second operation is hopeless, and therefore do not show themselves again. It may be noted in the second Table that the percentages given by me do not correspond with those in the original papers, but that is mainly because the authors excluded the cases lost sight of, and thus got a better percentage result. I think that the second column, which takes into account all the cases which were operated on up to within three years before the publication of the report, represents fairly accurately the proportion of cures in the hands of these particular surgeons.

The study of the second Table fully justifies, I think, what I have said as to the necessity for extensive operation, and the advantages to be derived from it. Contrast the older results from Trendelenburg's, with 4 per cent. of cures, to Fischer's, with 15 per cent., or, taken altogether, an average of about 10 per cent., with the more recent results, varying from 15 per cent. in Küster's practice, up to 57 per cent. in my own, and we see that, as the result of greater care in operating, the chances of cure have been largely increased, and the recent results in this Table ought to be really better, for a little study of the methods employed by some of the surgeons in the more recent period, shows that even there the operations were not so complete as could be wished. The value of even an imperfect improvement is well shown in Esmarch's results, where, during the first period up to 1863, the old plan of operating was employed with only 4 per cent. of cures; while afterwards the axilla was cleared out more or less thoroughly, with a jump at once to 18 per cent., a result more than four times better.

Looking at my own results, it will be seen that the effect of

thorough removal of the disease is very marked indeed. Taking the cases which have been operated on in the manner described up to three years ago, 21 in number, we have no deaths, 12 or 57 per cent. of cures, and 9 or 42·7 per cent. of cases recurring either externally or internally. And if it be objected that 21 is a small number of cases to argue about, I would point out that 12 cures is more than can be shown by many of the older surgeons, although their cases exceed 100.

Again, if we study my results from the point of view of the return of the disease, taking in the recent cases, we have a total of 61 cases, with 20 or 32 per cent. of recurrences or metastatic deposits, and among those recurrent cases were two (Nos. 29 and 56) which were really inoperable (in one of them, indeed, visible disease being left behind), and which only raise the percentage of failures unnecessarily; and also included in these are two cases (Nos. 24 and 48) in which I only assume that there was a metastatic deposit, but have nothing but suspicion to go upon. Excluding the two cases (Nos. 29 and 56) as being inoperable cases, as is usually done in the statistical reports I have quoted, we would have 59 cases operated on with reasonable hope of cure, with 16 certain recurrences, or 27 per cent. Some of these, it is true, have only been operated on quite recently, and they therefore are not of much value, although it must be remembered that by the older methods local recurrences in half the cases took place within three months of the primary operation. At the same time, let us exclude the cases operated on during the last year (and, as I have previously mentioned, over 80 per cent. of the recurrences take place during the first year after operation), I say, excluding the cases operated on during the last year, we are left with 40 cases, with, at the very worst, 16, or 40 per cent. of internal or external recurrences (and that is including Nos. 24 and 29). Taking the external recurrences alone, we have in the 61 cases only 11 external recurrences (again including No. 29), giving an average percentage of external recurrences of 18 per cent. As regards the 12 "cured" cases, of course recurrence may still take place in some, but taking the most unfavourable statements, viz., König's, that 15 per cent. recur even after three years, we would still be left with nine cures (and that is leaving out also Case 9), which died well after three years), or 42 per cent. of definite cures —a result far superior, however it is worked out, to that obtained by the ordinary operation.

I have already referred to Halsted's paper (which up to the present has shown the most favourable results as regards recurrences), and he points out that in his 50 cases he has only had three local recurrences; but he has also had eight regional recurrences, and, as I have already said, I think it is much fairer to combine his local and regional recurrences under one heading, external recurreuces, as I have done in my own statistics; and this gives him a percentage of 22 per cent. external recurrences. Contrast the results as regards external recurrence obtained by Halsted (22 per cent.) and myself (18 per cent.) with those of surgeons operating less completely, as worked out by Halsted. For example: Billroth, 85 per cent.; Czerny, 62 per cent.; Fischer, 75 per cent.; Gussenbauer, 64 per cent.; Volkmann, 59 per cent., &c., and the difference between the old, imperfect operation and the thorough one becomes most striking and unmistakable.

While the results, as I have pointed out, are steadily improving, the proportion of cases which succumb to cancer is still considerable, and will not, I think, be much reduced till patients and doctors understand that there is a good chance of radical cure from early and thorough operation in mammary cancer, and that a suspicious lump in the breast, especially in elderly women, is not a thing to be watched; for I may say that over 90 per cent. of the swellings of the breast in elderly women are cancerous. Many of the deaths now are from internal metastatic deposits, and these are, of course, beyond the control of the surgeon, and can only be avoided by early operation. Indeed, it seems to me that in recent work metastatic deposits are apparently more frequent than formerly, but that is no doubt in part due to the fact that patients escape the local recurrences and live longer, and that thus the internal deposits have time to grow and attract attention.

Contrary to the usual dictum, it is now found that the most favourable of all cases for operation are those of atrophic scirrhus, and the more nearly a cancer approaches the atrophic form the greater is the chance of permanent cure; indeed, I believe that the malignancy of the cancer in the individual cases has a great deal to do with the result of operation, possibly more than the early period of the operation, but that, expressed in other terms, is only to say that in the less malignant forms of cancer, the disease does not diffuse itself so rapidly or widely, and that by

an extensive operation we have a better chance of getting beyond it. A patient who comes with a small tumour which has been noticed for several months, which has not markedly increased in size, and in connection with which we have only small glands in the axilla, has a much better chance than one who has found a tumour quite recently, which is noticeably enlarging and in which the axillary glands are of considerable size. In the former case the probability of getting beyond the disease is great, on account of its slow spread; in the latter the reverse is the case. Hence, while the sooner a cancer of the breast is radically removed the better, one cannot say that the chance of cure is necessarily proportionate to the early period of the operation; in any case, however, the chance of cure of necessity depends on the thoroughness of the operation.

I need not enter at length into the objections which are urged to these thorough operations. They are usually brought forward by those who only operate with the hope of adding a few months to the patient's life, and not of curing the disease. I may, however, refer to the one question of mortality. Formerly the mortality was great, and was much increased by opening the axilla, and this was due to sepsis. As that is avoided nowadays, we may safely conclude that when the argument of mortality is brought forward, the arguer does not keep his wounds aseptic. Halsted, in his 50 cases, has had no deaths; in my 61 cases I have had one death, with which probably the ether had as much to do as the operation; in fact, I think shock is practically the only risk which we have to face, and there is no question that the patients do suffer a considerable amount of shock in some cases; on this point I cannot agree with Halsted, who minimises the risk from this cause. In addition to shock, more than one writer has referred to pneumonia as occasionally occurring, possibly from long exposure in a cold room in the case of predisposed individuals, and I had this experience in one case where I performed an extensive operation for recurrence, the primary operation having been done by another surgeon. As regards the question of functional disability which is also sometimes brought forward, there is really comparatively little. At first, no doubt, the patient finds that the movement of the arm is very considerably impeded, but as time goes on this becomes more free, and ultimately, as a rule, the patient is able to do most things which

she wishes. After all, even if the arm were permanently useless, it would be a comparatively small price to pay for life.

I have previously mentioned several cases in which I do not consider that a radical operation is advisable, and the question in these is whether anything can be done in the way of prolonging the life of the patient, or of making the period of life that remains to her more comfortable. In some of these cases the patient's life can, no doubt, be prolonged by excision of the breast alone, or of the axillary glands as well, perhaps for three or four months, or even as long as a year, and she may then die of internal disease without suffering so much as she would have done from the local tumour. She should, however, be told that the object of the operation is merely to prolong life, and many women, knowing that, would prefer not to undergo it. In some cases where there is a foul ulcer, the patient may be relieved of much pain and trouble by removal of the breast. On the whole, however, I do not see any particular advantage in operating in cases of breast cancer unless with the view of curing the disease; and in cases where it is practically certain that the disease cannot be cured, the performance of an operation would depend entirely upon the patient's desire for a short prolongation of life or on the possibility of relieving her of some serious trouble. As a matter of fact, we do not have here, as we have in intestinal cases, any substitute plan to offer which will either relieve the patient materially or give any marked prolongation of life. It is practically either a thorough operation or nothing, and therefore the breast is not a situation in which the so-called careful selection of cases and exclusion of all but simple cases from operation is at all permissible.

LECTURE II.

In this and part of the next lecture I propose to consider the question of cancer as it affects the mouth and throat, more especially the pharynx. Here, as in the case of the breast, there is no real alternative operative procedure to that of removal with the view of cure. Œsophagotomy, gastrostomy, or tracheotomy, although they may prolong the patient's life for a very short time, do not add materially to his comfort and can in no way be looked on as alternatives to a radical operation, and in these cases therefore, as in the breast, I do not think that we can do very much in the way of selection of cases for operation.

As compared with cancer of the breast, the disease in the throat is in some ways more favourable for cure, in other ways less so. As regards the primary disease, the breast cancer is by far the most favourable of the two, for there it is fully exposed to view, and there is plenty of room for its free removal without endangering important structures. In the mouth and throat, on the other hand, the disease is close to, if not involving, many important parts, the space in which one has to work is very limited, one cannot get much margin of healthy tissue around, and the early spread of the cancer to muscle, especially in the case of the tongue, tends to distribute it over a considerable area. In the throat, also, the disease is much less favourable for operation, because the septic element comes into play, and thus, instead of having to do with an operation, as in the breast, where the mortality is practically nil, we have to face a very considerable risk of death from septic disease.

On the other hand, cancer in the mouth and throat is more favourable as regards the glandular deposits, for in the neck we have an extensive glandular area exposed to view which can be much more thoroughly dealt with than in the case of the breast. It is true that many surgeons look on the glandular trouble as a most serious part of the disease, but for reasons which will be afterwards stated, I do not agree with this view. In one other respect, also, cancer in the mouth and throat is more favourable than that in the breast, viz., that metastatic deposits, which so often disappoint us in the latter case, are quite infrequent in the former.

Cancer in the mouth and throat is most conveniently considered under three heads, viz.: (1) cancer of the tongue; (2) cancer of the pharynx, tonsil, soft palate, epiglottis, &c.; (3) cancer of the larynx.

1. Cancer of the Tongue.

So much has been written already on cancer of the tongue that I will not take up time in discussing it, more especially as I wish to go pretty fully into the question of cancer of the pharynx, a still more serious form of the disease, one about which less has been written, the operations for the relief of which are among the most formidable and difficult in surgery, and which has recently interested me very much. I may, however, be asked whether I adhere, in the case of the tongue, to the principles of treatment laid down with regard to the breast, more especially with regard to two points. Firstly, as cancer of the tongue very soon spreads into the muscular substance, must Heidenhain's law be followed, viz., the removal of the whole muscle; and, secondly, should the nearest lymphatic glands be taken away in every case? The answer is practically Yes to both questions.

If we want justification for thorough operations in the case of cancer of the tongue, it is to be found in the great frequency of recurrence after operation, varying from 61 per cent. in Kocher's statistics up to 89 per cent. in Winiwarter's. It is difficult to estimate the relative frequency of local and glandular recurrences, and they most usually occur together, but, on the whole, local recurrences seem to be quite as frequent as glandular recurrences alone.

The question of how much of the tongue should be removed, and more especially whether the geniohyoglossus should be followed quite down to the hyoid bone, depends very much on the situation of the disease. Cancer of the tongue, as it comes under the notice of the operating surgeon, presents itself under two chief forms, viz., either as a more or less superficial warty growth, especially along the sides of the tongue, or as a deep ulceration extending well into the substance of the organ. In the former case, the deeper muscles of the tongue are not yet affected, in the latter they are; and, corresponding to this, we find a difference in the results of operation. Taking one of the most recent statistics of tongue cancer, viz., Kocher's results as published by Willy Sachs (Langenbeck's 'Archiv,' vol. 45), we find that in 19 cases the cancer was more or less superficial, and that of these three were

cured by operation (taking the three-year limit), or 15 per cent., four had remained well for one year or more, two died, and of the remainder five, or 27 per cent., certainly recurred, and the ultimate result of the others is not known; while there were 27 cases where the cancer had penetrated into the deeper substance of the tongue, of which only two, or 7 per cent., were cured, four died, and the remainder either recurred or there is no note of them after operation—certainly 11, or 40 per cent., are known to have recurred. In the superficial form, the tongue is not saturated with the cancer cells to anything like the extent that occurs where the disease has extended deeply into the muscle, and accordingly we have the more favourable results just alluded to, and the operation need not be so severe. Thus, in the superficial and laterally placed tumours, removal of the half of the tongue is in all probability sufficient, and where the tumour does not extend deeply into the substance of the muscle, the muscular fibres need not be followed down to the hyoid bone; on the other hand, where we have to do with a cancer which has penetrated into the substance of the tongue, we must look on the whole of the tongue muscles, at any rate on that side, as infected, and whether we content ourselves with the removal of the affected half or not, we must follow the muscular fibres right down to their attachment to the hyoid bone.

A second point to be noted in connection with operation for cancer of the tongue is the distribution of the lymphatic vessels. Where the cancer affects the base of the tongue, we have to do with a large lymphatic plexus which is not unilateral, and under these circumstances we often find enlarged glands on both sides of the neck. This plexus runs into glands in the anterior triangle about the angle of the jaw, and the lymphatic vessels seem to be specially connected with or related to the posterior belly of the digastric muscle. On the other hand, many of the lymphatic vessels at the anterior part of the tongue and the floor of the mouth run towards the submaxillary region, and it is there, and subsequently about the cornu of the hyoid bone, that the first enlargement of lymphatic glands is usually evident.

Where the disease is superficial and affects the front part of the tongue, the glands are not so early affected, and it is not so necessary to remove the glandular area in the first instance, but I think it is always well to take away the submaxillary and sublingual glands on the affected side, along with the lymphatic glands

so closely associated with them, and therefore I always tie the lingual artery in the neck, and clear out these glands with the fat in the neighbourhood, even although no glands can be felt, and then clip out the tongue from the mouth. In this case, the wound in the neck does not communicate with the mouth, and remains aseptic and does not, therefore, add anything to the danger of the operation. Where, however, the cancer extends deeply into the substance of the tongue, and more especially where it is situated at the back part, some more severe procedure, such as Kocher's operation, with thorough removal of the glandular area and of the muscle down to the hyoid bone, becomes requisite.

Where the disease affects the back part of the tongue, and division of the jaw is necessary, we have to deal usually with much more extensive operations, and with regard to these operations I shall have something to say when we come to speak of cancer of the pharynx.

The mortality in the latter cases is naturally greater, but has been much reduced of late years in accordance with improved methods of treating the wounds. Kocher's results show this very markedly, for while prior to 1882 he had five deaths in 29 cases, or 17·2 per cent., between 1882 and 1888, when he improved his methods, he had one death in 28 cases, or a mortality of 3·5 per cent. So also Winiwarter, publishing in 1878, gives a mortality of 42 per cent., while Volkmann had only two deaths in 91 cases, or a mortality of 2·2 per cent.; Winiwarter's large mortality being essentially due to sepsis, septic pneumonia, &c. Taking mild and severe cases together, and the statistics of a large number of surgeons, the mortality may be estimated at from 15 per cent. to 20 per cent.

The great advantage of operations confined to the interior of the mouth, such as Whitehead's operation, is that the wound is limited in extent and does not extend into the tissues of the neck, and the chief objection which is urged to the complete operation of the removal of the lymphatic areas along with the tongue, is that suppuration is apt to extend along the planes of the cellular tissues of the neck. I must say, that although I have done a considerable number of operations, both on the tongue and pharynx, on these principles, I have not had this occurrence, and that I attribute partly to the careful preliminary preparation of the mouth, teeth, &c., to which I shall subsequently refer, to care

with regard to the purity of the instruments and hands, and to the provision of very free drainage, so that there is no bagging of the septic materials from the mouth in the neck wound.

The great point is to keep the wound more or less aseptic, at any rate for a few days, till the cellular spaces are blocked by new cells, and till granulation is occurring. One of the most important preliminary procedures is the thorough cleansing of the teeth before the operation, which, curiously enough, is scarcely ever carried out. In cases of cancer of the tongue, especially where the floor of the mouth is the seat of the disease, and more especially in hospital patients, foul material collects about the teeth in large quantities, and is ready to infect the freshly cut surface, and one must remember the important part which dosage plays in the subsequent severity of the disease. Great care must therefore be paid to this matter, for some days before the operation, and at the time, the teeth, both in front and behind, being thoroughly and repeatedly cleaned with a brush and with antiseptic solutions, such as sanitas, permanganate of potash, &c.; and at the time of the operation this should be still more thoroughly carried out, and any bad stumps should be taken away. The patient should also wash out his mouth frequently with the same antiseptic, so as, as far as possible, to get rid of the foul material; and at the time of the operation for cancerous ulcers of the mouth, if they are within easy reach, I generally, when the patient is under chloroform, after drying them, swab them over with undiluted carbolic acid, so as to destroy as far as possible the masses of septic material which are present in the wound. Subsequent to the operation, the use of a 10 per cent. solution of chloride of zinc as recommended by Sir Joseph Lister, or of iodoform in moderate quantities, is of some advantage, but I agree with Kocher that the chief point is the plugging of the wound with antiseptic gauze, such as cyanide gauze sprinkled with iodoform, which is frequently changed, and is of value in soaking up the discharge and preventing its decomposition. I believe, however, that the essential point is the cleansing of the mouth and the wound before and at the time of the operation; and the second essential is that the discharge runs freely away, and in all cases where a communicating external wound is made, one or more drainage tubes of large size should pass freely into the mouth.

As regards the results, it must be confessed that true cures are

comparatively rare, and are not, of course, nearly so frequent as in the breast, but this is to a great extent due, I think, to neglect in taking away enough of the tongue muscles in deep-seated cases, and more especially to not clearing out the glandular area properly. And, further, some surgeons are very apt to look on glandular enlargements, unless very small, as inoperable, and thus abandon patients to their fate who might, I think, still have had a fair chance by operation. Winiwarter gives 2·3 per cent. of cures and 42 per cent. mortality; Konig, 12 per cent. cures and 28 per cent. mortality; Kocher (leaving out the last three years), 18 per cent. cures and 11 per cent. mortality. With regard to Kocher's cures, eight in number (one after operation for recurrence), it must be noted that in two of them cancer again appeared in the mouth 10 and 12 years respectively after the operation; while one died seven years later of cancer of the stomach. The first two cases must, however, I think, be looked on rather as fresh disease than as recurrence of the former.

I feel sure that when the recent work on cancer is more thoroughly applied to the tongue, more especially as regards the removal of the glands, we may look for further improvement in the results. I must not, however, take up more time in considering disease of the tongue; what I have to say about the removal of the glands and the after treatment in connection with pharyngeal disease applies equally to cancer of the tongue, and therefore I shall leave these points till I come to speak of cancer of the pharynx.

The limits of the operation for cure in cases of disease of the tongue are, in my opinion, the following:—Very extensive infiltration of the tongue muscles, especially downwards towards the hyoid bone; extensive affection of the jaw in addition to the tongue; extension to the upper part of the larynx; and involvement of the carotid artery and vagus nerve in the large glandular mass. In these cases I doubt if we can do very much in the way of operation which can be beneficial to the patient. In cases where the glandular enlargement is marked, some surgeons advise the removal of the tongue with the view of taking away the disease in the mouth, which is the most distressing thing to the patient, but an essential for such a procedure is that there shall be a good probability of subsequent non-recurrence in the mouth, and for my own part I think that in most cases where the disease in the mouth is of such small extent as to render it probable that

it will not recur locally after operation, the glandular disease can also be taken away and a cure aimed at. In cases where the glandular enlargement is really inoperable, the removal of the tongue, if local recurrence did not take place, would, no doubt, be of advantage to the patient; but, failing that, we must be content, so far as operative measures are concerned, with such substitutes as division of the gustatory nerve, tracheotomy, &c.

2. Cancer of the Pharynx.

Cancer may begin anywhere in the pharynx, but most commonly (apparently in over 60 per cent. of the cases) it commences in the mucous membrane over the tonsils or pillars of the fauces, and spreads from thence over the neighbouring parts. From the tonsil the disease spreads most often and earliest on to the pillars of the fauces and upwards to the soft palate, next most frequently downwards on to the base of the tongue, and lastly, backwards over the pharynx; indeed, in most cases which come under view, one usually finds most or all of these parts affected, even on the first occasion when one sees the patient. Epithelioma, also, sometimes, though not nearly so commonly, begins about the epiglottis and orifice of the larynx, and the third point of selection is lower down, close to or at the commencement of the œsophagus.

It is remarkable how little trouble the disease causes at an early period; sometimes, as in the ninth case (No. 39, Table III), the patient does not observe anything wrong till the occurrence of bleeding attracts his attention. In other instances, as in Case 4 (No. 127), he first notices a frequent desire to clear his throat, or again, in Case 6 (No. 26), a feeling of uneasiness and dryness about the throat, and, very commonly, pain shooting up to the ear. Indeed, in not a few instances, the first thing which leads him to call in a surgeon is the enlargement of the cervical glands in the neighbourhood of the angle of the jaw. Consequently, as epitheliomata in this region apparently grow very readily and rapidly, it is but seldom that the patient seeks advice before the disease has spread to an alarming extent, and when he does apply, the case is generally regarded as hopeless, and he is condemned to palliative treatment. Nevertheless, as will be evident from the list of cases I have put together, a considerable number of operations have been performed for cancer in this region, the success, however, naturally being limited, owing to the desperate nature of the case and the peculiar position of the disease, to some extent to

the removal having been imperfectly carried out, and also to the limited experience of individual operators, owing to the rarity of the disease.

In considering the question of cancer of the pharynx, it is most convenient to divide this part into several regions, for the method of operation and the results of treatment vary very much according to the part affected. Thus, we may speak of (1) Cancer in the naso-pharynx, (2) Cancer affecting the soft or hard palate alone, (3) Cancer affecting the tonsillar region and spreading from thence to the neighbouring parts, (4) Cancer affecting the pharynx proper, and (5) Cancer affecting the pharynx and larynx. Of these, I have omitted entirely cancer of the soft or hard palate alone, because these cases are comparatively limited and readily dealt with from the interior of the mouth, and also because many of the palate tumours described as alveolar sarcomata and adenoid carcinomata, are in reality quite simple growths, and have no tendency to recur after removal. Nor have I gone into the results with regard to cancer of the naso-pharynx, but I nevertheless mention three cases in which I have operated in this situation, more, however, with a view of putting them on record than for the purpose of discussing this part of the subject. Further, I have in my list included sarcomata as well as carcinomata, and I have done so on account of the great interest of the operative procedures, and the fact that, apart from the likelihood of recurrence, the question whether we have been dealing with a sarcoma or a carcinoma does not materially influence the methods of operation, the functional result, or the result as regards life.

I think I can best give a view of the whole matter if I devote the rest of to-day's lecture to a description of the cases in which I have myself operated, up to the beginning of this year, and then subsequently refer to the tables which have been placed in your hands, giving the operative results which have been attained in this disease. In the first place, I shall describe three cases of disease in the naso-pharynx.

Case 1.—*Lympho-sarcoma of the left side of the Naso-pharynx, involving the Eustachian Tube, and growing from the base of the Skull.*

The patient was a male, aged 46, and was first seen by me on March 9th, 1892. The patient consulted Dr. Urban Pritchard

about a year previously on account of buzzing in the left ear; at that time there was no suspicion of new growth. About six months afterwards he noticed that he was becoming deaf on the left side, and for the last three months he had observed that there was some obstruction of the left nostril. He therefore saw Dr. Pritchard for the second time at the end of February, 1892, and on examination a growth was found on the left side of the naso-pharynx, blocking and apparently involving the Eustachian tube. Dr. Pritchard had a consultation with Dr. Greville Macdonald, and as a result the situation and extent of the growth were described to me, and the problem was put whether any operative interference was possible in the case of a malignant tumour in this region. The patient was particularly desirous, in connection with his private affairs, that if possible some extension of life might be obtained for him.

I took the matter into consideration, and decided that an operation was possible, and accordingly I saw the patient on March 9th, 1892, and found the following state of matters. The patient was in good general health, and had not been losing flesh or strength lately. The various organs of the body appeared to be healthy. The hearing on the right side was normal, on the left side a watch was only heard when applied to the ear; breathing through the left nostril was almost completely obstructed. On looking into the mouth, nothing could be seen beyond fulness of the soft palate on the left side. With the rhinoscope a prominent tumour was evident, projecting on the left side of the naso-pharynx, reaching inwards as far as the septum, downwards to and involving the soft palate, backwards to the back of the pharynx, and upwards to the base of the skull. The Eustachian tube was apparently involved in the growth, and in our opinion it had started from that part. The tumour was slightly ulcerated at the upper part, but there had been no bleeding nor pain. With the finger the outlines of the tumour could be readily made out. It did not seem to extend into the nasal cavity, but it pushed down the soft palate and extended into it. A mass of enlarged glands was felt at the upper part of the left anterior triangle and extending under the sterno-mastoid muscle. This mass was not at all freely movable.

I explained to the patient the extent and seriousness of the operation, and the great probability of recurrence, but as it was of

great importance to his family that he should live as long as possible, he decided in favour of the operation.

On March 13th, 1892, I performed the following operation, assisted by Messrs. Stanley Boyd and Burghard. Just at the time that this case occurred, Dr. Wright had published some papers on the value of chloride of calcium in increasing the coagulability of the blood, and also of fibrin ferment as a styptic, and I therefore asked him to be present and to superintend the use of these substances, for I anticipated that there would be a good deal of bleeding. Accordingly, an hour before the operation, a pint of water containing half an ounce of chloride of calcium was injected into the rectum, and during the operation pledgets of salicylic wool soaked in Wright's fibrin ferment solution were applied to the freshly cut surfaces. Whether as the result of this treatment or not, the fact is that extremely little blood was lost: I do not think more than an ounce or an ounce and a half in all. By means of an oblique incision carried along the anterior part of the sterno-mastoid muscle, a mass of glands was removed from the neck. They were deeply seated, being attached to the fascia over the atlas, the spinal accessory nerve running in front of them. In addition, the fat and tissues in the vicinity were, of course, also taken away. After their removal, the tumour could be felt from the wound, and as it was ascertained that the vessels were in no way involved in it, the further operation was proceeded with.

The next step was the performance of tracheotomy and the insertion of a Hahn's tube. I then proceeded to remove the upper jaw on the left side, the usual skin incisions being made. The periosteum and mucous membrane of the hard palate were, however, detached from the bone and left behind, and the orbital plate of the superior maxilla was also left. After the removal of the upper jaw, the base of the pterygoid process was divided with bone forceps and the process removed; the front of the tumour could then be seen. The next step was to detach the tumour from the external pterygoid muscle, the other tissues outside it, and the soft palate. It was then found to have originated from the periosteum of the base of the skull and to have grown downwards along the side of the pharynx, involving the Eustachian tube in its course. A portion of the Eustachian tube was removed, and the mucous membrane all around the tumour was divided.

The periosteum over the whole roof of the naso-pharynx was then carefully detached as far out as the foramina for the vessels, and as far forward as the disease seemed to extend. A layer of the surface of the bone was then chipped off, and the whole bare surface cauterised with Paquelin's cautery; the hard palate was then stitched to the cheek, and the wound closed with sutures. As has already been said, very little blood was lost, and, as a matter of fact, the preliminary tracheotomy proved to have been quite unnecessary. The operation lasted about two hours.

There was remarkably little shock after the operation, and by the evening it had quite passed off. There is very little to say about the further progress of the case. The temperature only once reached 100° F., and that was on the morning after the operation, and the further progress towards recovery was uninterrupted. It was very extraordinary what an entire absence there was of septic absorption. The tracheotomy tube was left out on the day after the operation, all the stitches were removed on the fifth day, the patient got up on the tenth day, and left town on the twenty-third day.

Very shortly afterwards he was able to resume business, and for about fifteen months there was no sign of recurrence in the nose, although in March, 1893, that is to say, a year after the first operation, I removed some small glands from the left posterior triangle of the neck. In July, 1893, however, he began to have some bleeding from his nose, and accordingly I reopened the scar and found that recurrence had taken place at the roof of the nasal cavity in front of the former seat of the disease, the situation of the original tumour, however, remaining perfectly well. I cleared this part as thoroughly as possible, and for a time he went on very well; but in the spring of 1894, about two years after the first operation, he began to go downhill, bleeding occurring again from the nose, and glands enlarging on the other side of the neck. He gradually became worse, and ultimately died on December 14th, 1894, two and three quarter years after the first operation, having had time to put his affairs in good order and to provide for his family.

Quite recently I have had another somewhat similar case, which I may introduce here.

CASE 2.—*Lympho-sarcoma growing from the base of the Skull and projecting into the Naso-pharyngeal Cavity.*

Female, aged 24. Admitted to King's College Hospital, December 2nd, 1895. The patient had noticed stuffiness in her right nostril as long ago as last August, but thought it was due to a cold, and paid no attention to it. It, however, gradually became worse, and a few days before admission she consulted Dr. W. H. Dobie, of Chester, who diagnosed the condition of matters and sent her up to me. The patient was a young woman in good health, who had not been wasting, and only complained of this feeling of stuffiness in the nostril. Nothing was seen by inspection of the mouth, but with the finger a hard mass was felt through the soft palate, especially on the right side. On examination with the rhinoscope, a rounded swelling was seen growing from the roof of the naso-pharynx and filling up most of the space; no ulceration over it, and it was not pedunculated. With the finger passed up behind the soft palate, a firm tumour was felt which apparently did not extend into the nasal cavity, and was nearly centrally situated; no enlarged glands in the neck.

On December 22nd, 1895, the patient was anæsthetised with chloroform, and the soft palate was split in the middle line, the incision being carried through the mucous membrane and periosteum of the hard palate nearly to the front. The periosteum of the hard palate was then peeled off the posterior part, and by means of a chisel and hammer a curved portion of the back part of the bone of the hard palate, as well as the posterior part of the vomer, was chipped away. The soft parts being held aside by a string passed through each flap, a very fair view of the tumour was obtained, the head hanging down. An incision was then made through the mucous membrane and periosteum over the base of the skull all round the growth, and as far from it as possible, and then the periosteum with the tumour over it were detached. After detaching the periosteum, and after bleeding had been arrested by pressure, the whole raw surface was thoroughly painted over repeatedly with nitric acid, and after the acid had acted for some time, a solution of carbonate of soda was applied to the part. The soft and hard palate were then united with stitches, no dressing of any kind being applied to the wound. The recovery was uninterrupted. The palate united perfectly, and

when the patient was sent home on January 10th, the raw surface was granulating nicely and seemed perfectly healthy. From the second day after the operation the patient was kept in a sitting position.

In this case it will be seen that a totally different method of procedure was adopted to that which was employed in the former case. In the former case, however, the tumour was unilateral, and, as far as one could judge, extended well into the side of the neck, and it did not seem at all possible to get satisfactory access to it from below; in the latter case it was centrally situated, and it seemed to me that the method employed would be sufficient. I must say, however, that of the two plans I believe the former, namely the excision of the upper jaw, or at any rate a temporary resection of it, and removal of the pterygoid process, is much the more satisfactory. In the first case I could see exactly what I was doing, and had no difficulty in obtaining complete access to the whole affected area; in the latter case it was difficult to be quite certain whether I had got well beyond the growth at the anterior part; and though this last plan may be useful in cases where the tumour is quite small and centrally placed, I should be inclined in most cases to employ the former method. The remarkable absence of any septic phenomena in both these cases is very striking, and I attribute it mainly to the free escape of the discharge from the surface of the wound as the result of the position of the patient, and also to scrupulous care in cleansing the mouth and in avoiding the introduction of any septic infection from without. Both cases show that tracheotomy is quite unnecessary in these operations.

The following case may also be added to this group, although here the disease extended further forwards.

CASE 3.—*Spindle-celled sarcoma growing from the roof of the Nasal Cavity, involving the Sphenoidal, Ethmoidal, and Frontal Sinuses, and destroying the upper part of the Nasal Septum.*

The patient was a female, about 40 years of age, sent to me by Dr. Edward Law, and seen on February 14th, 1894. There was a history that the patient had suffered from nasal polypi for 10 years, these polypi being, however, not the ordinary mucous polypi, but evidently of a more or less malignant character. She had been

operated on many times and in many ways. Recently she had been under the care of Professor Volkmann, who had attempted to destroy the growth with the thermocautery, and, as a result, the orifice of the nostril had been much burned and had become so contracted that it was impossible to see into it. The right nostril was completely filled up with growth, which distended the nose and destroyed the nasal bones, and at the bridge of the nose a soft tumour was felt and seen projecting forwards; the frontal eminence was much more marked on the right side than on the left. The right eye was pushed outwards, and also projected forward. There was no swelling of the superior maxilla, but electric illumination of the mouth showed a greater area of opacity on the right side than on the left. By posterior rhinoscopy, a globular mass with a smooth surface, and of a mucous appearance, was seen projecting into the naso-pharynx and pressing on the right Eustachian tube. The nasal septum was pushed towards the left and almost blocked the left nostril. The patient was a prima-donna contralto, and, curiously enough, her singing voice was unaffected.

On March 7th, 1894, I performed the following operation. An incision was made along the right side of the nose from the frontal bone downwards to the back part of the orifice of the nostril, and the ala and right side of the nose were detached and turned over to the left side, the skin being carefully separated from the tumour in front. The tumour was partly cystic and was gradually separated from its attachments along with as much healthy tissue as possible. It filled and distended the right frontal sinus and projected somewhat into the left, but it came completely away along with the mucous membrane. It opened and projected into the right orbital cavity, and it grew from the whole of the roof of the nasal cavity, especially on the right side, and had destroyed the vomer at the upper part. Great care was taken to remove all the periosteum and the walls of the various cells as far as was consistent with safety. The surface of the bones was then cauterised and sponged with undiluted carbolic acid; the skin was replaced in position and stitched, and a plug was introduced into the right nostril so as to keep it open during the healing process. The right antrum was also full of pus, and it was opened in the usual manner through the alveolus, and a drainage tube inserted into it.

Here, again, the subsequent progress of the case was absolutely

free from any fever or other cause of anxiety. The temperature did not rise above 100° F., and she left the home within three weeks, apparently well. She remained well till a year ago, since which time I have not seen or heard of her. At that time she was hoping to get an engagement in an opera abroad, and probably was successful. The tumour was a spindle-celled sarcoma.

I have put these three cases together on account of their great interest, but I have not made any attempt at collecting the cases of operation for malignant tumours in the naso-pharynx, and therefore I shall not dwell on them. I have already mentioned the two modes in which access was gained to the tumours in the first two instances, and the remarkable freedom from sepsis in the after progress of all the cases. How far the operation in these cases is worth while, is a matter which is difficult to determine. I believe that in a carcinomatous affection of these parts it would certainly (unless the disease was very extensive) be well worth while, but lympho-sarcoma is notably a very disheartening disease to operate on. Nevertheless, in the first case to which I have referred, the result, although not a cure, was such as to place the patient in a very much better position than if the operation had not been done; and he himself was more than satisfied that the operation he had gone through was well worth the result obtained.

In the following cases we have to do with tumours lower down, in the pharynx proper, or in the neighbouring parts. First a case affecting both larynx and pharynx, then three successful cases, then three fatal ones, and lastly, one where local recurrence took place.

Case 4 (No. 127, Table III).—*Epithelioma of the right side of the Pharynx, the Epiglottis, right Aryteno-epiglottidean Fold, the pharyngeal mass being also adherent to the Thyroid Cartilage.*

Male, aged 42, under the care of Dr. Roxburgh, of Weston-super-Mare. About the end of June, 1892, the patient had a feeling of stiffness about the right side of the throat when he yawned, but he did not pay any particular attention to it, and otherwise he had no trouble or pain. He saw Dr. Roxburgh about it for the first time on July 24th, and he diagnosed a malignant ulcer of the pharynx. The patient came up to town next day and saw a laryngologist, who confirmed the diagnosis,

and thought that the disease might be removed by operation. Two or three days later (on July 28th) he saw Dr. Greville Macdonald, who came to the same conclusion, and who arranged for me to go down and see the case, and, if I approved, to operate. I saw the patient on August 1st, 1892, and operated the same day.

On examination, I found him in good general health, and his various organs were healthy. Nothing was visible on inspection of the throat from the mouth, but with the laryngoscope a ragged ulcer somewhat larger than a shilling was seen on the right side of the pharynx, spreading on to the right aryteno-epiglottidean fold, and possibly as far as the right side of the epiglottis. The vocal cords were normal. As far as any of us who had seen the case could judge, the disease was quite limited: until we came to the actual operation, we had no idea that it had spread superficially in the mucous membrane to the extent which we found had taken place.

The following were the steps of the operation. Preliminary tracheotomy performed and a Hahn's tube inserted; a long incision was then made parallel with the vessels, and a transverse one along the border of the great cornu of the hyoid bone. The vessels were pulled outwards, and the submaxillary gland was raised. It was found impossible to save the superior laryngeal nerve on that side. The pharynx was opened from the side, and the disease exposed. It was found to be much more extensive than had been supposed, because it spread superficially and had not led to any marked thickening of the mucous membrane at the edge of the growth. It reached to the middle line behind, on to the tongue in front, and was adherent to the wing of the thyroid cartilage, but it was very difficult to define its extent on account of its superficial spread. The whole mass was removed, viz., the affected portion of the pharynx, the right aryteno-epiglottidean fold, a small part of the tongue, the greater part of the epiglottis, and a piece of the wing of the thyroid cartilage. The Hahn's tube was left in, and a feeding tube was introduced into the wound.

The patient stood the operation well, the Hahn's tube was changed the next day for another, and as a section of the epiglottis made in the meantime showed that the epithelioma was spreading superficially quite to the edge of the cut surface, the small remaining piece was clipped out. For the next two days the patient went

on very well, but on the 4th August signs of septic pneumonia appeared, and he went very rapidly downhill, and died on the following day.

Case 5 (No. 22, Table III).—*Round-celled sarcoma of the right Tonsil, side of Pharynx, soft Palate, and lower part of the Naso-pharynx.*

Male, aged 45. Sent by Dr. Felix Semon, and seen by me on June 13th, 1894. Six months previously an enlarged gland was removed by another surgeon from the right anterior triangle of the neck, and on microscopical examination was said to be of a simple character. At that time nothing was noticed in the throat. About four months before I saw him, he began to suffer from uneasiness and pain in his throat, but he did not consult anyone till June 13th, when he saw Dr. Semon, who, thinking that it was a case which might be operated on, sent him on to me.

On examination, the right tonsil was seen to be much enlarged, ulcerated, hard, and fixed. The disease extended to the wall of the pharynx and on to the right side of the soft palate, and appeared to be adherent to the external pterygoid process. From the history of its rapid growth (for the history, as I understood it at the time, was but of a few weeks' duration) and its general characteristics, it seemed to me to be infiltrating the tissues around to a great extent, and I thought that there was no reasonable prospect of taking away all the disease, and therefore advised him not to have an operation done, and this advice agreed with that of the surgeon who had previously operated on him, and who came to me with him.

I did not see the patient again till August 29th. I then found that the tumour had increased greatly in size, and was now filling up the pharynx to a considerable extent, reaching well beyond the middle line. It interfered greatly with swallowing, and to some extent with breathing. The tumour was still very hard and ulcerated, but it did not give me the same impression of wide infiltration which it did formerly. I therefore reconsidered the question of operation, and came to the conclusion that it might, after all, be possible to remove the tumour, and seeing that he had not many weeks to live, I put the question of operation to the patient (who, by the way, was a medical man), and he decided in

favour of it. There were one or two enlarged glands in the anterior triangle of the neck at the seat of the former operation.

On September 11th, 1894, I operated as follows:—In the first instance an incision was made along the line of the vessels, the glands removed, and the external carotid artery tied; the cheek was then split from the angle of the mouth to the masseter muscle. An incision was now made through the mucous membrane in front of the growth, the lower part of the pterygoid process was removed with bone forceps, and the affected portion of the soft palate was clipped away with scissors. At this stage it was found that, owing to the throat being filled up with the growth, the patient could not breathe properly during the necessary manipulations, and therefore tracheotomy was performed and a Hahn's tube inserted. By means of a blunt instrument, the tissues in front of the tumour were separated till the internal pterygoid muscle was exposed, and a layer of that muscle was removed with the tumour in front of it. It was then easy to define the upper, posterior, and lower borders of the growth, and the healthy tissue was clipped through well beyond it on all sides. The growth had become adherent to the Eustachian tube, and a small portion of that tube was therefore removed. Hardly any blood was lost. The wound in the cheek and the external wound, which, I think, did not communicate with the mouth, though I am not quite sure, were stitched up, a drainage tube being inserted in the latter.

The patient had practically no shock after the operation, and during the course of the case there was an entire absence of all septic complications, the temperature not once going above 100° F. On the next day, however, the patient had intense pain in his liver, which alarmed me very much, but on inquiry I found that this was a condition to which he was subject, which he termed "Suakim liver," and from which he had suffered periodically since the Egyptian campaign. His treatment for this condition was absolute starvation, and for nearly a week he would not take anything by the mouth, and subsisted on rectal enemata and nutrient suppositories. When this liver trouble had passed off, he was able to swallow fairly well, and there has been no trouble in swallowing since. The tracheotomy tube was left out on the day after the operation. The patient left the home between three and four weeks after the operation, and is still alive and well.

The local result has so far been absolutely satisfactory; there

has been no local recurrence whatever, and the functional result is perfect. There is no difficulty in speaking or swallowing. Although there has been no local recurrence, I found in March of last year that several glands had become enlarged in the lower part of the anterior triangle and under the sterno-mastoid, and I therefore performed a somewhat elaborate operation with the view of clearing them out. Last summer, also, he came to me and pointed out a small gland in the posterior triangle which he thought was enlarging, and I therefore cleared out all the glandular tissue from the posterior triangle and root of the neck, but found none which showed evidence of disease. (In April, 1896, I found two deeply-seated enlarged glands in the upper part of the anterior triangle of the neck, which I removed.)

Case 6 (No. 26, Table III).—*Epithelioma of the left Tonsil and soft Palate, with a large mass of glands in the anterior triangle of the Neck adherent to the vessels, extending under the Sterno-mastoid Muscle, and up to the base of the Skull.*

Male, aged 55, sent by Dr. Felix Semon, and seen by me on October 13th, 1894. The history was that the patient first began to feel uneasiness about the throat during the previous June, and at that time he was treated for gout. In July he noticed a swelling on the left side of the neck, and since that time the throat trouble has steadily increased, and the glands have gone on enlarging. In September he saw a well-known surgeon, who said that the disease was malignant, but that no operation was possible. Dr. Semon, whom he then consulted, having the experience of the preceding case before him, thought that something might be done, and therefore asked me to see him.

His condition at that time was as follows. Towards the upper part of the left tonsil there was a patch of ulceration with a very hard base and edge and a warty surface, which spread on to the pillars of the fauces and involved a considerable portion of the soft palate. There was also a very large mass of glands in the left anterior triangle, extending from the mastoid process downwards to the level of the thyroid cartilage, and passing under the sterno-mastoid muscle. The mass was firmly adherent to the vessels. We came to the conclusion that an operation was

feasible, and accordingly explained to the patient its nature and risks. He at once decided to have it done.

The operation was performed on October 15th, 1894, and I was assisted by Dr. Semon and Mr. Venning. In the first place, a long incision was made along the anterior border of the sterno-mastoid from the mastoid process to about the middle of the thyroid cartilage, and the deep fascia being divided at the lower part, the jugular vein was exposed. It was found that the glands were firmly adherent to the sheath of the vessels, and therefore the jugular vein was tied in two parts below the mass and divided between the ligatures. The vein and glands were then raised in one piece, the deep fascia being divided well to each side, and it was found that the spinal accessory nerve passed through the middle of the mass. It was not, however, actually involved in the disease, and by separating the glands, the nerve was retained intact. The jugular vein was tied at its point of exit from the skull, and the mass of glands, with the vein and all the fat and glands under the sterno-mastoid and well into the posterior triangle on the one hand, and, on the other, right up to and behind the angle of the jaw, was removed. The external carotid artery was next tied, and the posterior belly of the digastric and the stylo-hyoid muscles were divided so as to allow the jaw to come well forward; and then, the head being thrown back over the table, and the mouth held open with a gag, the soft palate was clipped through well beyond the disease, and the mucous membrane was incised all round the area of the growth at a certain distance from it. By means of the finger in the external wound the limits of the growth were defined and the whole diseased mass was clipped out. A large drainage tube was inserted from the external wound, and the skin incision closed at the upper part by sutures.

The patient was a good deal collapsed after the operation, but recovered the same evening, and went on remarkably well. As in the previous case, there was no rise of temperature or septic complication. For three days he was fed by means of rectal enemata and suppositories, but on the fourth day he began to swallow a little, and succeeded fairly well by following a suggestion made by Dr. Semon, which was that he should lie flat in bed with his head turned to the right or sound side and hanging over the side of the bed. The food taken into the mouth in this way

ran down the healthy side of the pharynx, and he was able to swallow a good deal. His power of swallowing very soon increased, more especially as the communication between the wound in the mouth and the exterior became shut off very rapidly. He got out of bed for the first time on the sixth day, and the drainage tube was left out on the eleventh day. I had, however, to put the tube back again a couple of days later on account of accumulation in the wound, and this external sinus remained open for a few weeks, but closed before the end of the year without anything further being done for it.

When I saw the patient last, in the middle of January of this year, that is to say, fifteen months after the operation, there was no evidence of recurrence and he was in the enjoyment of perfect health. (Patient remains well, May, 1896.)

Case 7 (No. 112, Table III).—*Epithelioma of the base of the Tongue and the Epiglottis. A few small glands in the Neck.*

Male, aged 60, brought to me by Dr. C. A. Parker on November 20th, 1894. The history of the case was that for about six months the patient had noticed pain in swallowing, and lately had had neuralgic pains extending up to the ear. When we saw him together, a small mass of enlarged glands was felt at the angle of the jaw on the left side and at the cornu of the hyoid bone, but on looking into the mouth nothing could be made out there without the aid of a mirror. On using the mirror, however, a superficially ulcerated surface was seen at the base of the tongue, especially on the left side, and extending into the hollow between the tongue and the epiglottis, partially filling it up. The epiglottis was also thickened and ulcerated on its anterior surface. but the larynx was free.

On November 23rd, 1894, I performed the following operation. I began by a preliminary tracheotomy and inserting a Hahn's tube. A long incision was then made along the line of the vessels, and another nearly at right angles to it along the upper border of the hyoid bone. The glands were then removed, the external carotid artery tied, and the pharynx opened at the level of the great cornu of the hyoid bone. In order to get a good view of and free access to the base of the tongue and the epiglottis, it was necessary to clip away the cornu of the hyoid bone, but

when this was done excellent access was obtained to the parts. The superior laryngeal nerve was not divided. The epiglottis was then detached from its attachment in the angle of the thyroid cartilage, but was left attached to the tongue. A transverse incision was then made completely across the tongue, well away from the disease, and the posterior part, together with the epiglottis, was taken away. Some bleeding vessels having been tied on the opposite side of the tongue, the external wound was stitched up, a drainage tube being inserted at its lower angle.

The only point of note in connection with the after progress of the case was that the patient had an attack of bronchitis (to which he was very subject), and which began the day after the operation. For two or three days this gave rise to considerable anxiety, but it soon passed off, and otherwise his recovery was uninterrupted. He was fed for four days by rectal enemata and nutrient suppositories, and then he began to try to swallow some milk in addition. This he did not manage at all well, even with his head on one side, for about a fortnight, and then he gradually improved, and was able in another week to take the necessary quantity of food entirely by the mouth.

As regards the mouth and anterior triangle of the neck, the patient still remains well, there has been no recurrence in either situation; the functional result is excellent, he is able to swallow without difficulty, and only extremely rarely does he have a fit of coughing while doing so, and he is in excellent health at the present time, 15 months after the operation. (Remains well, May, 1896.)

In July of last year, however, I noticed an enlarged gland under the middle of the sterno-mastoid muscle on the left side, which increased in size somewhat rapidly. I cut down behind the sterno-mastoid and exposed the growth, and removed it, along with a portion of the jugular vein to which it was somewhat adherent, and with all the fat and glands that I could find in the neighbourhood and in the posterior triangle. While removing it, it gave way at one part, and some fluid containing flakes of epithelium escaped into the wound. I washed the wound out with sublimate, and then sponged the whole surface of the wound thoroughly with undiluted carbolic acid. The wound healed by first intention, except where the drainage tube was, which I had put in on account of the application of carbolic acid, but this also

healed in a very few days, the application of the acid not apparently interfering with the healing at all. For two days, however, he showed considerable signs of carbolic-acid poisoning, curiously enough the first occasion on which I have seen evidence of carbolic-acid poisoning after the application of undiluted carbolic acid to a raw surface.

At the end of December of last year he showed me a small gland on the right side of the neck opposite the right cornu of the hyoid bone, which had increased somewhat in size of late. I therefore removed this gland along with the material in the neighbourhood, and found on microscopical examination that it also was epitheliomatous. The wound healed by first intention, and the patient remains without any further appearance of disease, now about 15 months since the first operation.

You may naturally inquire why I applied undiluted carbolic acid to the wound in the neck in the second operation. My action was founded on my experience in the case narrated in Lecture I, p. 12, and my object was to destroy any epithelial cells which might have remained in the wound.

Case 8 (No. 38, Table III).—*Epithelioma of the right Tonsil, spreading on to the Tongue, floor of Mouth, soft Palate, and side of Pharynx. A mass of glands at the angle of the Jaw.*

Male, aged 44. Admitted to King's College Hospital on June 7th, 1895. For the last few weeks the patient had noticed some hoarseness, and about a fortnight before admission he had found a swelling at the angle of the jaw. This swelling increased rapidly. On examination, a large ulcerated, warty growth was seen on the right tonsil, extending on to the soft palate, pharynx, floor of mouth, and base of tongue. Within the last few days it had interfered with swallowing and to some extent with breathing. There was also pain of an intermittent character running up to the ear. The larynx and epiglottis were free. There was a mass of glands at the angle of the jaw.

On June 12th, 1895, the following operation was performed. In the first place the trachea was opened and a Hahn's tube inserted. A long incision was then made on the right side of the neck, along the anterior border of the sterno-mastoid muscle, and the mass of glands with the material beneath the sterno-mastoid

and the jugular vein was taken away. A second cut was then made parallel to the hyoid bone, and the submaxillary gland with the adherent lymphatic glands removed. The external carotid artery was then tied. The mouth having been opened, the cheek was split from the angle to the masseter muscle. Free access was then obtained to the disease in the mouth. With scissors, the healthy tissue around the growth was divided, the finger in the outside wound pushing aside the carotid artery and vagus nerve, and indicating the limits of the disease. The posterior half of the tongue on the right side was taken away, along with the floor of the mouth at that part, tonsil, pillars of the fauces, part of soft palate, and portions of the pharynx, the whole being removed in one mass. The wound was stuffed with cyanide gauze sprinkled with iodoform. A stomach tube having been inserted, the external wounds were stitched up, a large drainage tube, however, being fastened into the lower angle of the cervical incision, and passing into the mouth; a fresh Hahn's tube was then put in.

There was a good deal of shock after the operation, but the patient had recovered from that by the next morning, and he went on well, the temperature only twice reaching 100°. For four days the stomach tube was left in untouched, and then it was subsequently passed whenever necessary. He began to try to swallow on the 21st June, but without very much success. However, this rapidly improved, and at the time of his death he was able to swallow practically all that was required in the way of nourishment. A fresh Hahn's tube was put in on the day after the operation, and on the second day an ordinary tracheotomy tube was substituted for it and kept in for two days. The drainage tube in the neck was left out on the tenth day. The patient was doing remarkably well, and it was a question whether he should not go home, when on the 7th July, 25 days after the operation, while he was washing out his mouth previously to taking some food, it was noticed that the material was stained with red blood. This rapidly increased in amount, and in three minutes, before assistance could reach him, he was dead, the blood having apparently passed straight down his larynx and choked him.

On *post-mortem* examination it was found that the wound was looking remarkably well, contraction had been going on rapidly, and a good deal of it had become lined with epithelium. At the

lower angle, there was quite a small sinus which ran down to the ligatured external carotid artery, and this ligature had become partially separated. There was no clot whatever in the artery; the lungs, trachea, &c., were full of blood. There was no sign of any recurrence, the disease apparently having been completely removed.

Case 9 (No. 39, Table III).—*Epithelioma of the Tonsil, soft Palate, side of Pharynx, and right side of the Tongue. A large mass of glands in the right side of the Neck.*

Male, aged 56, seen in consultation with Dr. Semon and Mr. Horsley on June 28th, 1895. The history of the case was that the patient was not aware that anything serious was the matter with his throat till three weeks previously, when suddenly a quantity of blood came into his mouth along with some very foul-smelling discharge. For some time previously his throat had been uneasy, but he had not paid any attention to it. A few days before we saw him he had consulted a surgeon, who had refused operation.

On examination, a considerable mass of glands was felt on the right side of the neck at the upper part of the anterior triangle, evidently adherent to the vessels, and extending under the sterno-mastoid muscle. On opening the mouth, a projecting warty mass was seen on the right side of the throat, and extending on to the tongue; it had apparently begun in the tonsil, which was deeply excavated, and from thence had spread on to the neighbouring parts. Only the back part of the tongue was affected, but there the disease went pretty deeply; above it had spread on to the palate, and behind to the side of the pharynx; the epiglottis and the larynx were free. The lower and posterior limits of the disease could be felt. The patient did not complain of any acute pain, but the ulcer was constantly bleeding, and there was much foul discharge from it. The patient appeared to be a robust man, but was not so in reality, his urine contained one-eighth of albumen, and his pulse was quick and readily compressible, frequently numbering 120. From my experience of the preceding cases, especially the last, which was at that time going on extremely well, it was evident that the disease could be removed with a reasonable prospect of success, while it was clear

that the patient had only a very short time to live—probably only a week or two—if nothing were done. The whole matter was therefore put before the patient, special stress being laid on the risks of the operation, and chiefly, as it happened, on the danger of septic pneumonia and septic disease generally; but he expressed himself as most anxious to have the chance.

On July 1st, the following operation was performed, in which I had the advantage of the assistance of Mr. Horsley and Dr. Semon. In the first instance preliminary tracheotomy was done, and a Hahn's tube inserted. An incision was then made along the anterior border of the sterno-mastoid muscle, and the mass of glands, which extended up to the mastoid process and under the muscle, was removed along with the jugular vein, the external carotid artery, and the digastric and stylo-hyoid muscles which were involved. The cheek was then split from the angle as far as the masseter, and the mass in the mouth was removed in one piece, in the same manner as in the last case. It was then found that the internal carotid artery was involved in the growth, and was, in fact, lying almost bare on the surface of the ulcer of the tonsil, so that bleeding would almost certainly have occurred from it in a few days. As the patient was by this time suffering a good deal from shock, more so than any of the other cases, and as his pulse was very small, I feared that the removal of the diseased portion of the artery would produce so much anæmia of the brain as to preclude the chance of his recovery from the shock, and therefore I thought it wiser to peel off the tumour as far as I could from the artery, and then remove it later, when he had somewhat recovered. The wound was then stitched up, the pharynx being packed with iodoform gauze, and a drainage tube was inserted at the lowest angle. A stomach tube was also introduced. Strychnine was given before and during the operation. The Hahn's tube was removed after the operation, and a Parker's tube substituted for it for 24 hours, when it was left out.

For some hours the patient lay in a very collapsed condition, but gradually improved towards evening, and the next morning, after I took out the packing and the tracheotomy tube, he began to mend rapidly. During that day we began to feed him with the stomach tube, and he was able to sit up and wash out his mouth with sanitas at frequent intervals. He went on steadily improving,

his temperature having only once been up to 100° F., till the morning of the fourth day, when he seemed quite himself again. I, therefore, thought that the time had come when the piece of diseased artery might be taken away with safety, and accordingly I gave him a little chloroform, and, dividing the stitches, I passed a ligature above and below the diseased area, tied the vessel, and removed the intervening portion. This was done quite easily, with almost no disturbance of the wound, and no bleeding. The part exposed was then touched with undiluted carbolic acid, with the view of sealing the tissues against septic infection, and the stitches were re-inserted. The patient passed an excellent day, but towards night he began to cough and had much difficulty in bringing up a quantity of tenacious mucus, his temperature began rapidly to go up, and signs of septic pneumonia set in, of which he died on the morning of the sixth day after the operation. It was noticed also on the fifth day that there was paresis of the leg and arm on the left side, and it is possible that this condition, which was no doubt the result of the ligature of the internal carotid artery, may have considerably contributed to the fatal result.

The occurrence of septic pneumonia after all operations in the throat is, of course, very common, quite apart from the severity of the operation, and it so happened that it was a danger to which I specially called attention before the patient decided on the operation; and the only question which exercises me is whether the interference on the fourth day led to it, or whether it would have occurred in any case; and also how far the paralysis which followed the ligature of the artery had to do with the fatal result. I do not think that it would have been wise to have left the diseased portion of artery in the wound for a longer time, and the disturbance caused by its removal was extremely slight, and I can hardly think that the infection occurred at that time. At the same time, it is a perfectly open question whether it would not have been wiser to have risked taking the artery away at the time of the operation.

Case 10 (No. 40, Table III).—*Epithelioma of the right Tonsil, floor of the Mouth, base of Tongue, pillars of the Fauces, soft Palate, and side of Pharynx. Glands in the Neck.*

Male, aged 55, sent to me by Dr. Harvey, and admitted to King's College Hospital on July 22nd, 1895. The first thing that the patient noticed was the swelling of the glands in the neck about two months before admission, and about that time he also had shooting pain about the base of the tongue. About a month before admission he first observed a growth on his tongue. The patient was old for his age, and was not a very strong man, but had no organic disease of any kind. His only complaint was of intermittent shooting pain, inability to move his tongue properly, and frequent presence of blood in his mouth.

On examination, the glands in the anterior triangle were found to be considerably enlarged, more especially towards the angle of the jaw, but also extending as low as the thyroid cartilage. On examining the mouth a large cauliflower growth was seen at the back of the right side of the tongue, which extended on to the floor of the mouth, the right tonsil, and the adjacent part of the soft palate; its further extent could not be made out on account of difficulty in opening his mouth till he was under an anæsthetic, when it was found to extend some distance on to the side of the pharynx. The entrance to the larynx and the epiglottis were free.

On July 24th, 1895, the glands and the neighbouring tissues were dissected out from the anterior triangle, but it was not necessary to remove the internal jugular vein; the posterior belly of the digastric, however, was found attached to the growth and was taken away. A ligature was put round the external carotid artery, but was not tied, and the wound was stitched up. Owing to his condition, I thought it advisable to defer the completion of the operation for a week.

The wound healed by first intention except where the ligature was, and on July 31st, 1895, the second part of the operation was proceeded with. In the first instance the trachea was opened and a Hahn's tube inserted, the greater part of the former incision was re-opened, and the ligature which was lying around the external carotid artery was tied. The incision was then extended forwards under the angle of the jaw, and the submaxillary gland, which had not been removed in the previous operation, was taken

away. The cheek was then split, and half of the tongue freed right down to the hyoid bone, and removed along with the rest of the growth in one piece. A large drainage tube was inserted, the wound was packed with cyanide gauze sprinkled with iodoform, and a tube passed into the stomach. The rest of the incision was then stitched up.

The patient did not have any very marked collapse, and passed a very good night afterwards. The next morning, however, it was evident that his mind was deranged, and he was most difficult to manage, both as to feeding and in other ways; and I may here say that from this time till the end of the case he never recovered his reason. As he had pulled out the œsophageal tube during the first night, it was passed whenever it was necessary to feed him, but he struggled very much against it, and it had to be done by force. Apart from his mental condition, he went on very well for some days, but there was more septic decomposition about the wound than had occurred after any of the other operations. Still, his temperature remained normal till the eighth day, when it became somewhat irregular, going up to about 101° in the evening and falling in the morning. The tracheotomy tube was left out on the day after the operation. On the twelfth day (August 11th) he coughed up a little blood, and a little was seen to be oozing from the wound. Pressure was applied to the carotid and the bleeding ceased, the amount of blood lost being estimated to have been about half an ounce. I was sent for, but being out of town, one of my colleagues ultimately arrived two hours after the bleeding ceased, and he at once tied the common carotid artery low down in the neck, thinking that probably the blood had come from the external carotid artery. Next day it was noticed that there was paresis of the left arm and leg, and this had developed by the following day into complete hemiplegia. On August 14th there was a repetition of the bleeding which had occurred on August 11th, and when I opened up the wound I found that it simply came from the granulations, and it did not again recur.

His condition from this time onwards was a very bad one. He was completely deranged and very difficult to deal with, would not open his mouth, and could not understand what he was told to do. His left side was completely paralysed, including the left side of his pharynx, while we had removed the right side; consequently he could not swallow, and the saliva, mucus, and

discharges accumulated in the wound in spite of all that we could do to prevent it, and no doubt passed down into his lungs. His temperature continued to go up, and he had a good deal of cough. He continued very much in this condition, gradually going downhill till August 31st, when he died, a month after the operation.

On *post-mortem* examination, gangrene of the upper lobe of the right lung was found, with a considerable quantity of pus lying in it. There was white softening of the anterior part of the right cerebral hemisphere as far back as the fissure of Rolando. There was no clot in the carotid artery.

This case was a very unfortunate one, and was especially complicated by the ligature of the common carotid artery, which I must confess I do not think was necessary. At the time when it was done, the bleeding had stopped for two hours, and as was shown afterwards by the recurrence of the bleeding, the blood had not come from the external carotid artery, and this is further evident from the fact that no clot formed in the common carotid after the ligature, so that bleeding could still have gone on. The immediate result of this ligature was the complete hemiplegia mentioned above, and after that the patient had no chance of recovery. I certainly myself would have been very chary about tying the carotid artery under the circumstances which were present. At the same time, I doubt whether the patient would have recovered apart from this occurrence, for my own experience of post-operation mania, of which I have seen five or six cases, is very bad, and I think that as a rule the patients die, and I believe this is the experience of other surgeons. At the same time, the case furnishes a very instructive warning—especially when taken in connection with Case 9 and several cases which will be found in Table III, where ligature of the internal or common carotid artery after operation on the throat has been followed by hemiplegia—showing us that such a procedure is accompanied by the very greatest risk, and should only be done in the absence of any other possible method of meeting the circumstances of the case. Against this statement may be instanced the fact that in the next case (Case 12) I ligatured the internal carotid artery for hæmorrhage without any such result, but in that instance the artery had been compressed in the midst of cicatricial tissue for some months and was very much diminished in calibre, and by

that time no doubt the cerebral circulation had sufficiently adapted itself to the small amount of blood brought by it, and its ligature did not produce any serious effect.

Case 11 (No. 84, Table III).—*Epithelioma of the left Tonsil, pillars of the Fauces, and soft Palate, spreading on to and involving the lower Jaw at the posterior part. A mass of glands in the anterior triangle of the Neck.*

Male, aged 55, sent to me by Dr. Harvey and admitted to King's College Hospital on July 15th, 1895. The patient first noticed tenderness in his throat and gums about six weeks before admission, and very shortly afterwards a swelling appeared in the neck. Thinking that the trouble was due to a bad tooth, one was extracted, but without any good result. There was a mass of considerable size at the posterior part of the left anterior triangle and extending under the sterno-mastoid; this mass was very slightly movable. On looking into the mouth, an ulcer with hard edges and warty surface was seen on the left tonsil, reaching and firmly adherent to the alveolar border of the lower jaw, spreading into the soft palate, and to a slight extent to the gum of the upper jaw; it also reached the floor of the mouth, but had not yet affected the tongue. The patient was a stableman and addicted to drink, but the various organs were healthy.

As the disease was extensive, and the patient somewhat weak, and as I had to leave town for a few days, I thought it would be better to divide the operation into two stages, removing the glandular mass in the first instance and then subsequently the disease in the mouth. Accordingly on July 16th, 1895, I made a vertical incision over the glands and removed them along with the structures which they involved, namely, the internal jugular vein, the external carotid artery and its upper branches, the hypoglossal nerve, the digastric and stylo-hyoid muscles, and all the fat and glands under the sterno-mastoid muscle. As the wound was an aseptic one, I had no anxiety about the matter, and the patient had no bad symptom.

On July 24th I proceeded to the second part of the operation, viz., the removal of the mass in the throat. After performing tracheotomy the upper part of the first incision, which had healed, was opened up and a fresh cut was carried forward from it in a

curved manner over the submaxillary region, and the submaxillary gland, with some enlarged lymphatic glands adhering to it, was removed. This flap of skin, together with the masseter muscle, was then turned upwards and the jaw sawn through in front of and behind the affected part. The interior of the throat could now be well seen, and an incision was made around the growth and it was removed, the pterygoid process being clipped off and taken along with the mass. As a week had elapsed since the ligature of the external carotid artery, I was very much afraid that anastomotic circulation would have been re-established in the part and that there would be great trouble from oozing. To my surprise, with the exception of the skin incision, which bled pretty freely, there was no more bleeding from the deeper parts than if the external carotid artery had just been tied. The wound was packed with cyanide gauze powdered with iodoform, and the greater part of the skin incision was stitched up, room being left at the lower part for the subsequent insertion of a drainage tube.

The patient went on very well without any febrile symptoms, and he was fed for about a fortnight with the stomach tube, passed when necessary. At the end of that time he began to swallow and was soon able to take sufficient fluid nourishment. He was discharged towards the end of August in very good health. In the beginning of October, however, it was found that there was an excavated ulcer in the middle of the scar opposite the part where the angle of the jaw had previously been. Examination of scrapings from the interior of the ulcer showed numerous epithelial cells, and its margins were hard. It was, therefore, evidently a recurrence. The patient was accordingly re-admitted to the hospital on October 7th.

Case 12 (No. 62, Table III).—*Second operation.*

His condition on admission was that he had this hard nodule in the mouth, and the greater part of it was ulcerated. On October 9th, 1895, the following operation was performed:—A curved incision was made from just in front of the ear forwards for about 4 inches, following the anterior border of the lower jaw. A considerable portion of skin above this incision, which was somewhat adherent, was removed. The cheek was split from the angle of the mouth to meet the former incision, and the whole of the upper part was

dissected up, the edges of the wound being well separated, when the recurrence was seen to be much more extensive than was supposed. It involved the masseter and internal pterygoid muscles, and also the ascending ramus of the lower jaw. This portion of the jaw was disarticulated and removed, and the whole of the masseter and internal pterygoid muscles, part of the pterygoid plates, and as much of the scar tissue as possible were taken away. As I was not quite certain with regard to the scar tissue whether I had quite got all the disease, I applied nitric acid to the raw surface; the wound was stuffed, a large gap being left, no attempt at a plastic operation was at that time made. No tracheotomy.

The patient was a good deal collapsed after the operation, but recovered and went on very well till the ninth day, when bleeding occurred from the wound, and on investigation it was seen to come from the internal carotid artery, which was lying free on the surface of the wound. The artery was tied above and below and divided. No symptoms of paralysis followed the ligature of the artery, and the patient went on very well. He was fed with a stomach tube, it being impossible for him to swallow on account of the large opening in his cheek. The greater part of the wound having healed, the hole in the cheek was filled up by a plastic operation on November 20th, 1895, the edges being pared and a large flap of skin being brought over from the back of the neck. In three or four days he was able to swallow very well, and he was discharged on December 11th.

(This patient died at the end of February, 1896, the cause given being increasing weakness and inanition without local recurrence. I did not see him.)

LECTURE III.

In this lecture I propose to discuss the various points raised by the cases of cancer of the pharynx which I narrated on the last occasion, viz., the methods of operating, the after treatment, and the results.

In connection with this matter I have searched the literature very thoroughly for all cases of similar operations on the pharynx, and the result is shown in Table III. In this table I have included cases both of sarcoma and carcinoma for the reason previously stated, but I have excluded instances where the disease only affected the soft palate or the hard palate, and did not extend on to the wall of the pharynx. I have also not included some comparatively trivial operations which have been performed from the mouth; operations, for example, where little pieces of tumour growth have been clipped away or snared, and where the problems which one wishes to consider do not arise. A few operations which appear, at first sight, to come under this head do undoubtedly appear in the first division of the table, but they are very few in number, and I have not sought to add to them, and, on the whole, those included even in the first group have been extensive.

I have also excluded, as far as possible, operations which were manifestly left incomplete; for example, one case often quoted, where the larynx was removed, but where the disease was left in the tonsil and side of pharynx. Such cases are of no value for our purpose. A few have also been left out in which the method of removal employed has been manifestly inefficient, for example, a case by Studsgaard, where a sarcoma was removed by scraping away the tumour. And, lastly, I have omitted two cases which are frequently referred to in the papers which I have read, namely, one by Schönborn and one by Richardson, where large sarcomata in the wall of the pharynx were removed from outside without opening the pharyngeal cavity. With these exceptions, I have, as far as I can find, included all cases that have been published. I am quite aware that some may possibly have been overlooked, and I hope, if this is the case, that my attention will be called to them; and it would be very important, also, if those who have

reported the cases immediately after operation, and in which, therefore, the results still remain incomplete (unfortunately a considerable number), would furnish the information necessary to complete the cases. At the end of the table will be found a reference to a few other operations, which I have met with more than once in the course of my reading, but the details of which I have not been able to find.

Before proceeding to consider the results as shown by this table, I must make some remarks with regard to various points in connection with the operation. It will be seen on studying the various cases that numerous methods have been employed for gaining access to the parts, and some of these methods have been extensively advocated. Perhaps the operation which has gained the greatest popularity is V. Langenbeck's method of gaining access to the tonsil by division of the jaw in front of the masseter. According to this method an oblique incision is made in the anterior triangle downwards to the cornu of the hyoid bone, and then the cheek is divided from the angle of the mouth obliquely downwards and outwards, this incision crossing the jaw just in front of the masseter muscle, and joining the former in the neck. The jaw is then sawn through in front of the masseter, and the parts being held aside the tonsillar region is exposed to view. Many modifications have been introduced in this method, more especially in the way of skin incisions, but to these I need not allude. A very important alteration has, however, been made by Mikulicz, which is coming into vogue, and consists in division of the ascending ramus of the jaw just above the angle, and the extirpation of the whole ramus. A third method, which has also been a good deal employed, is V. Langenbeck's subhyoid pharyngotomy, in which a transverse incision is made in front of the neck through the thyro-hyoid membrane close to the hyoid bone, and the epiglottis being hooked aside, a good view of the interior is obtained. My own opinion, however, is that no particular method can be followed in these cases. They are, as I have already said, rare, and the number which falls into the hands of any one surgeon must be very few, and consequently they will all probably differ from one another in the extent and distribution of the disease; hence, each case probably requires a different method of attack, and the surgeon must carefully plan out each operation for himself, and not follow any definite rules.

I shall not discuss all the various questions which arise with regard to the operation, but shall content myself, as regards the method of operation, by referring to the following four chief points, viz.: (1) the question of preliminary tracheotomy; (2) the control of the bleeding; (3) the removal of the glands; and (4) the methods of gaining access to the primary cancerous mass. After considering these points, I shall then refer to the after treatment and the results.

(1) *The question of Preliminary Tracheotomy.*—It is, of course, an advantage, if one can manage it, to avoid preliminary tracheotomy, for that adds additional complications in several ways. In the first place, it means another wound which must become septic, it means irritation of the trachea by the presence of the tube and the admission of cold air, and it also means very distinct interference with coughing and the power of expelling any discharges which may have entered the larynx. In one of my cases (No. 26) I was able to remove the disease satisfactorily without performing tracheotomy, but here it was located towards the upper part of the tonsillar region, anterior pillar of the fauces, and the soft palate, and the lower part in the neighbourhood of the orifice of the larynx was quite free. Further, the external carotid artery had been tied, so that, partly as the result of the situation of the tumour and partly as the result of the absence of bleeding, there was no need for tracheotomy. In Case 22 I tried to do without tracheotomy in the first instance, but when I came to deal with the tumour in the throat, I found that there was no room for my manipulations inside without completely blocking the breathing space, and therefore I had to perform tracheotomy in the middle of the operation. No doubt, in cases where the external carotid artery is ligatured, and the bleeding is consequently very small, there is not much chance of blood entering the trachea, especially if the head is thrown well back; and in cases where the jaw is divided, and more especially where a portion is taken away, it may also be possible to avoid the risk of blood passing into the lung. Where, however, an attempt is made to remove the tumour without division of the jaw, or without ligature of the external carotid artery, and where the mass fills up the throat, and more especially where it runs down towards the entrance of the larynx and on to the tongue, the necessary manipulations cannot be carried out without interfering with the breathing, and exciting so much effort on the part of

the patient that there is a very great risk of septic discharge and blood being drawn into the lungs; and besides, it is very necessary in these operations, in order to ensure that the disease is as thoroughly removed as possible, that there shall be no haste in their performance, and that the surgeon shall be able to see exactly what he is doing. Some prefer to do the tracheotomy three or four days before the major operation, but I fail to see the advantage of this; on the contrary, it must be remembered that after three or four days the discharge from the tracheotomy wound has become more or less septic, and, consequently, in introducing a big tube, such as Hahn's, some of the pus may be pushed before it into the trachea. It is well to bear in mind that where septic pneumonia occurs by direct entrance of materials into the air passages, and not as the result of a general infection, it is not the entrance of pure blood which sets it up, but of blood mixed with septic discharges, or of pure blood in the first instance fouled subsequently by the inhalation of the putrid materials from the wound.

On looking at Table III, it will be seen that in Group II A the mortality where tracheotomy was performed is double that where there was no tracheotomy, viz., 38 per cent. in the former case to 19 per cent. in the latter; and further, we find that of the fatal cases with tracheotomy (13 in number), seven, or 53 per cent., or 20·5 per cent. of the cases operated on (Nos. 39, 40, 72, 73, 78, 79, and 89), died of septic lung trouble, while only one, or 14 per cent. (No. 52), of the fatal cases without tracheotomy (seven in number), or 2·7 per cent. of the cases operated on, died from the same cause. On these bare facts one would be inclined to regard tracheotomy as a very serious addition to the risk, but on looking into the cases we see that those where tracheotomy was performed were on the whole much more severe, and consequently accompanied with greater danger. Further it will be found that in six out of the seven tracheotomy cases which died of septic pneumonia the base of the tongue was affected, and this was also the case in the patient who died without tracheotomy. It is evident therefore that the seat of the disease had much to do with the fatal result, and I do not think that we can fairly attribute the septic pneumonia to the tracheotomy. At any rate it is clear from these facts that preliminary tracheotomy is by no means an absolute safeguard against septic pneumonia, and I should be inclined to try to do without it where the disease

is high up, or where it is behind the tonsillar region, and where the base of the tongue or the neighbourhood of the glottis are not interfered with. Where the base of the tongue is interfered with, the patient does not swallow nearly so readily as where this is not the case, and consequently discharges are apt to accumulate about the orifice of the larynx and so get down into the trachea subsequently to the operation. Hence, in these cases, I think that it is well not only to perform preliminary tracheotomy, but also to go on with Hahn's tubes for some days after the operation, till in fact the patient has, to some extent, at any rate, regained the power of easy swallowing.

(2) *Control of the Hæmorrhage.*—In most of my cases I have tied the external carotid artery so as to have the seat of the primary tumour free from bleeding, and as regards this point the result has been extremely satisfactory. In none of the cases had I to tie or clamp any vessels with the exception of one or two veins, practically no blood was lost, and the area of the operation being more or less bloodless, one could remove the disease with precision and feel pretty sure that one was cutting wide of it in all directions. The control of the bleeding in this way is of the greatest importance, from the point of view, on the one hand, of the immediate danger of the operation, namely, the entrance of blood into the air passages, and on the other of the radical removal of the disease, but there are very serious objections to it, and I doubt if it is an advisable practice as a general rule. Working so much with aseptic wounds as one does nowadays, one is apt to forget that there is such a thing as secondary hæmorrhage, and that where a wound becomes septic, ligatures around large vessels very commonly ulcerate through, and then the main obstacle to hæmorrhage is the clot in the vessel. In the case of the external carotid artery, little or no clot forms on the proximal side of the ligature, and therefore if it separates too soon there is practically no barrier, and bleeding is very apt to occur. Hence, it has happened that in most of the cases in which the external carotid artery has been tied, severe and sometimes fatal secondary hæmorrhage has occurred from the artery. Thus, in my case No. 31, sudden hæmorrhage from the external carotid artery led to the immediate death of the patient at a time when one was quite free from anxiety about the case, and priding oneself on the excellent result which had been obtained. In this instance the patient had gone on without a bad symptom, there had been no

sepsis, fever, or anything untoward, the wound was contracting rapidly, the patient was feeling well and able to sit up, indeed, it was a question whether he might not leave the hospital, and, as was shown by the *post-mortem* examination, the disease had apparently been completely removed; and yet on the twenty-fifth day after the operation, it was sudden bleeding from the ligatured end of the artery which choked him before assistance could be obtained. This has also happened in several of Polaillon's cases, who has likewise tied the external carotid artery in most instances, and he has ultimately, as the result of his experience, come to the determination to abandon this procedure. Again, though not directly, yet indirectly, the ligature of the external carotid artery was also responsible for the death of my patient in case No. 40, for, had it not been tied, I think that my colleague would have opened up the wound and searched for the source of the bleeding rather than have immediately tied the common carotid artery. In this case paralysis followed as the result of the ligature of the artery, and that is an occurrence which has happened in other instances. I may refer to cases Nos. 24, 53, and 93 in Table III. It was partly with the view of avoiding this risk that I divided the operation into two stages in Case 84, and in that instance there was no trouble whatever with the ligatured artery, and the result as regards hæmorrhage during the second operation was perfectly satisfactory. In that case the ligature had apparently become firmly healed over before the wound was exposed to septic influences, no large collateral circulation had been established during the interval between the two operations, and there was practically no bleeding from the wound; in fact, less than in the other cases, probably because the internal jugular vein had also been removed at the same time as the operation on the glands and the branches leading to it had become blocked, so that we did not even have venous hæmorrhage. Whether this division of the operation into two stages is a good thing or not, I shall discuss by and bye; it certainly gives us a means of avoiding secondary hæmorrhage from the ligatured external carotid artery, and at the same time gives us a bloodless wound. Failing this division of the operation into two stages, I am inclined, much against my will, to give up the preliminary ligature of the external carotid artery in most cases, and either tie its branches or control the bleeding by temporary compression of the artery during the removal of the tumour. That, however, introduces another problem, namely,

division of the lower jaw, for without that, where the disease is situated in the tonsillar region, one might have difficulty in getting proper access to the bleeding points, while I think it is an advantage, if possible, not to interfere with the jaw. Where, however, for any reason the jaw has been divided, one can get good access to the bleeding points, and need not tie the artery previously.

(3) *The Removal of the Glands.*—The remarks made with regard to the removal of the lymphatic area in cases of breast cancer apply with equal force to these cases. It is seldom indeed that no enlarged glands can be felt, and in most instances they are of very considerable size. Whether glands are felt or not, however, the lymphatic area ought to be cleared out, and as I have already said, one of the great advantages of the cervical region is that a very large glandular area is accessible, and not only can a large portion be cleared out at the time of the operation, but also glandular recurrences beyond the anterior triangle, if seen early, can be freely and hopefully dealt with.

Most surgeons look on the presence of enlarged malignant glands in the neck—unless they are quite small and non-adherent to the vessels, and only one or two in number—as a contra-indication to operation in these and in tongue and larnygeal cases, or, at any rate, as a very grave complication. For my own part, I do not at all agree with this view unless the glandular enlargement is very extensive, or adherent to a variety of structures in the neck and not merely to the sheath of the vessels, and I see no contra-indication to operation in their presence; on the contrary, I think the operation will be more thoroughly done and the patient will have a better chance of recovery and cure if enlarged glands are already present; for, in the first place, where the glands are already enlarged, it is much more easy to remove the whole glandular area in one mass than it is where there are no enlarged glands to be felt; and in the second place, the presence of enlarged glands in the anterior triangle renders it imperative to remove the neighbouring lymphatic area, especially that under the sterno-mastoid muscle, so that if glandular recurrence subsequently takes place, it will in all probability be in the posterior triangle, that is to say in a part which is easily accessible for future operation. Where there is no noticeable enlargement of the glands on the other hand, it is a very difficult matter to take away all the glands and fat in the anterior triangle, while one is very

apt in an extensive operation to leave the material under the sterno-mastoid alone, and yet the glands in that situation are very early infected. Where an attempt has been made to remove this lymphatic area, and where it has not been successful and glandular recurrence subsequently takes place in the anterior triangle, we have in the second operation to deal with glands lying in scar tissue, and their subsequent satisfactory removal is a very difficult and sometimes almost impossible matter. These statements are not in any way theoretical, but are founded on considerable experience in cancer of the tongue and other regions in its neighbourhood, and also on a very extensive experience of radical operations for tubercular cervical glands, where the conditions, as regards operation and recurrence, are very much the same.

In carcinoma of the tonsillar region, the glands which are first affected are those beneath and behind the angle of the jaw, and very soon the chain which lies on the sheath of the vessels becomes attacked, as well as those under the sterno-mastoid muscle at the upper part close to the mastoid process; the lymphatic vessels in these cases seem to run in close relation to the posterior belly of the digastric muscle, so that I have had more than once to remove that structure. Where the disease is situated further forward on the epiglottis, the anterior part of the tongue, floor of mouth, &c., it is the glands in the submaxillary region and those about the great cornu of the hyoid bone which become infected in the first instance.

After the preliminary tracheotomy, the next step then in the operation is the exposure of the anterior triangle and the thorough separation of the fat and glands; and through the same wound the external carotid artery and its branches can be tied or controlled. For this purpose, the best incision is one running along the anterior border of the sterno-mastoid muscle, from the mastoid process above, down to the middle of the thyroid cartilage. The skin incision cannot be too free; the usual mistake that is made is to try to remove the glands through too small an opening, and we must remember that we have not only to take away the enlarged glands in the anterior triangle, but that we must also be able to lift up the sterno-mastoid muscle and remove all fat and glands beneath it, especially towards the upper part.

In the first instance the edge of the sterno-mastoid muscle is exposed, and the skin and fat in front of the incision are turned

well forwards; in the next place, I divide the deep fascia at the lower part of the incision and expose the internal jugular vein. It is very seldom, if the glands have attained any size, that they are not adherent to the sheath of the vessels, and therefore the anterior part of the sheath must be removed; indeed, where adhesion to the sheath is at all extensive (and in fact this is so in most cases of malignant glands), it is well to tie the internal jugular vein in two places at the lower part, divide it, and then peel it up along with the sheath and the mass of glands in front of it. In this way one can make a much better clearance of the anterior triangle than in any other; the lingual and other branches of the vein must, of course, be also tied, and the upper end can be readily ligatured close to its exit from the skull. As the mass is peeled forward, the deep fascia is divided in front and behind, care being taken with the spinal accessory nerve, which usually divides the glandular enlargement into two parts. In none of my cases have I found it actually involved in the growth, and usually without opening the diseased glands they can be separated sufficiently to disentangle the nerve. Next, by the aid of a curved blunt instrument, all the fat and glands must be detached from underneath the sterno-mastoid muscle right up to the mastoid process and well into the posterior triangle, and this material peeled off so as to leave the deep muscles clean. I consider that this is a most important thing to do, for recurrence very frequently takes place under the sterno-mastoid muscle, and it is almost impossible at a second operation to make sure of removing all the disease. If at the first operation there is a large mass underneath the muscle, and more or less adherent to it, the operation need not on that account be abandoned, but the muscle must be divided, or a part of it removed, and full access thus obtained to the seat of the disease.

With regard to the removal of the jugular vein, I may say that it need not give rise to the least anxiety; it does not add anything whatever to the danger of the operation, and I have also often had to do it in cases of operation for tubercular glands without any harm resulting. I have never seen reason to regret having taken it away, but I have more than once regretted that I had not done so, recurrence having taken place in small glands which had been left attached to the sheath and overlooked, but which would have been removed if the vein, sheath, and everything in front of it had been taken away in the manner above described. Besides, I

think that there is another great advantage in removing the vein in these pharyngeal cases, for if a septic thrombus should form in one of the small veins about the wound—as may very likely happen—it cannot get any further, and I have been much surprised at the small amount of septic disturbance in my cases.

Having in this way detached the mass of infected and healthy glands, the question comes whether it should be removed at once, or left attached to the anterior part so as to come away with the primary mass. I have already referred, in speaking of breast cancer, to the risk of infecting the wound by cutting away the breast from the axillary glands during the operation, and in the throat cases also, it is advisable, if possible, to maintain the connection. Where, however, the mass is at all large, this cannot be done, as one cannot see what one is doing at the upper part, and therefore in most of my cases I have gently torn across the connection between the primary tumour and the glands, not cutting the material across in case I should cut into some small diseased gland, and thus infect the wound. Where it is necessary to remove the glands from the submaxillary region, an incision may be carried forward from the upper part of this oblique incision, and will give complete access to the part.

In connection with the removal of the glands, there is one other point to which I may here refer, namely, the advisability of dividing the operation into two stages done on different days, in the first instance removing the glandular mass, and a week or ten days later attacking the primary disease. I did this in two cases, and the plan has advantages as well as disadvantages. The reasons which induced me to do it in these two cases were, in the first place and chiefly, that the patients were weakly, and that both the primary disease and the glandular mass were extensive, so that I feared the shock if the whole operation were done at one time. A second reason was that Case 38 had just previously died of hæmorrhage from the external carotid artery, and I thought that the risk of this would be considerably diminished if the end of the artery, lying in an aseptic wound for some days, were to become buried in new tissue. The third possible advantage of performing the operation in two stages is that the planes of the cellular tissue in the neck would become more or less sealed by organising tissue before being exposed to the septic influences from the mouth. The last is a point on which I do not lay much stress, but the other two points are important.

Against this division of the operation into two stages there is, however, one very serious objection, namely, that after removing the glands, open lymphatic vessels are left which may contain or convey cancerous material to the newly-made wound and thus infect it before the second operation, and this infection, being microscopic, could hardly be eradicated, unless possibly by painting the raw surface with a strong caustic. Case 84, in which I divided the operation into two stages, is the only one in which there has been a local recurrence, and in that case the recurrence was almost immediate, and yet when we had finished the operation, so far as we could judge, we had cut well wide of the growth in all directions and there was no trace of any disease to be seen. Here I am much inclined to think that there had been an infection of the wound from the divided lymphatics, and so strongly am I impressed with this risk, that I would not, as a rule, divide the operation into two stages unless under exceptional circumstances, such as great weakness on the part of the patient, or possibly in some cases where I thought ligature of the external carotid artery would be very desirable, and if I were to do so, I would thoroughly sponge out the re-opened part of the old wound with undiluted carbolic acid.

(4) *Access to the Primary Disease.*—There are many ways in which access has been obtained to the tonsillar region, but it is unnecessary for me to discuss them all. The essential point centres round the question as to whether it is necessary or not to divide the lower jaw, and as regards this we have again two points for consideration, namely, whether it is sufficient to divide the lower jaw, as in Langenbeck's operation, or whether it is not better to remove the ascending ramus altogether, as in Mikulicz's plan. Division of the lower jaw, or removal of the ascending ramus, are of course procedures which it is desirable to avoid if possible. In the first place, the division of the bone must add considerably to the septic risk by leaving a compound fracture in a septic wound, and it also must add to the shock. At first sight these statements seem to be in opposition to the facts as shown by Table III, where the mortality after division of the jaw is 26 per cent., as compared with 35 per cent. where the jaw was not divided; but in the latter case the numbers are a good deal smaller, and four of the seven deaths were due to hæmorrhage, other two also occurred in connection with ligature of arteries, and the seventh from post-operative mania, so that in none could

the retention of the lower jaw be held responsible for the result. In the second place, the divided ends of the bone have in several instances failed to unite, and a false joint has been left. Not that this is always a disadvantage, for where the disease involves the mucous membrane in front of the fauces, between the upper and lower jaws, the subsequent contraction of the wound is very likely to lead to more or less closure of the jaws, which, however, does not cause any very great inconvenience if there is a false joint in front. And lastly, necrosis of the divided ends of the bone has more than once occurred. On the other hand, there are great advantages to be gained by the division of the jaw, and in some cases it is absolutely necessary. When the jaw is divided in front of the masseter, and the two parts pulled aside, especially after division of the posterior belly of the digastric and the stylo-hyoid muscles, and with a skin incision running from the angle of the mouth to the upper part of the oblique incision in the anterior triangle, the whole region of the tonsil and side of the pharynx is completely exposed to view, and can be dealt with as precisely as if one were operating on a cutaneous surface; and if this is done, there is, of course, no necessity for ligature of the external carotid artery, the bleeding points being easily secured. Where the disease involves the periosteum over the jaw, necessitating removal of a portion of it or of the ascending ramus, the view obtained is still more perfect.

As regards the removal of the ascending ramus of the jaw, if the angle is also taken away the functional result is bad, the jaw being pulled over to that side and the lower teeth no longer meeting the upper, consequently the patient cannot masticate solid food. Mikuliez has overcome this difficulty to some extent by dividing the ascending ramus above the angle, and only removing that part, and he states that in his cases the functional result is excellent, while a good view is obtained, and there is no trouble from closure of the jaws as the result of contraction of the wound.

Where the jaw is divided, additional skin incisions are required. Langenbeck's is an oblique one, starting from the angle of the mouth and running to the anterior triangle across the jaw just in front of the masseter, and there are various other incisions made into which I need not go. I believe that where the jaw is to be divided, it is in most cases sufficient to make a curved incision

starting from the oblique one, opposite the angle of the jaw and running forwards along its lower border. By this incision carried well forward the submaxillary region can be cleared, and the flap being turned well up over the cheek, the jaw can be divided and the parts held aside.

With regard to this question of dividing the jaw, I would, however, point out that a marked increase in the space is obtained simply by dividing the posterior belly of the digastric and stylohoid muscles. After this is done, the jaw and the larynx can be pulled forward on that side to a very considerable degree. As I have already said, however, no two cases resemble each other, and the methods must be varied in each instance. In my opinion, the only constant incision is the oblique one, in order to get access to the glands, and to free the vessels so that they can be pulled out of the way when the primary mass is being dealt with. Any further incisions that are made will vary according to the necessity of the case.

In one of my cases, No. 26, I removed part of the soft palate, the adjacent part of the pharynx, the anterior pillar of the fauces, and the tonsil without dividing the jaw, or even making an incision through the cheek, simply by dividing the digastric muscle and then cutting through the mucous membrane in the mouth, well beyond the tumour on all sides, and removing the mass by working partly through the mouth and partly through the external incision. In four cases, by means of a long external incision, and by splitting the cheek to the masseter, I removed in case No. 22 the tonsil, soft palate, and side of pharynx as high up as the Eustachian tube, and in cases Nos. 38, 39, and 40 the tonsil, soft palate, side of pharynx, and part of the tongue. In one, No. 84, I removed a portion of the jaw, and in a recurrent case, No. 62, I divided the cheek according to Langenbeck's incision, and also took away the ascending ramus. In two cases again, Nos. 112 and 127, where the growth was lower down, I simply did a lateral pharyngotomy, but in these instances the tonsillar region was not affected.

As regards subhyoid pharyngotomy, that is to say, division of the thyro-hyoid membrance close to the hyoid bone, I do not think that there is any particular advantage in that in most cases. As I have already pointed out, one ought to open the anterior triangle freely in order to remove the glands in all instances, and

one of the chief objects of subhyoid pharyngotomy, as opposed to lateral pharyngotomy, is to save the superior laryngeal nerve. According to some writers this cannot be done where the subhyoid opening has to be extensive, though that is denied by others who have succeeded in avoiding division of these nerves, but, as case No. 112 shows, this nerve can also be spared in the lateral operation, and I believe one can get better access to the region of the epiglottis and the side of the pharynx and base of tongue by the lateral than by the subhyoid method. In my case, by an incision along the hyoid bone in addition to the usual oblique incision, and removal of the great cornu, I was able to take away the whole epiglottis and the back part of the tongue quite satisfactorily.

As to the method of removing these growths, it must be done by scissors or the knife, and they must be taken away in one piece. I do not think the result is at all satisfactory where the galvano-cautery, or the thermo-cautery, or the ecraseur are employed. It is of the utmost importance to be able to examine the cut surface in its natural state, so as to be quite sure that all the disease has been removed, and this cannot be at all made out if we have a burnt or crushed part to look at. Besides, if a burnt surface is left, a slough must separate, and bleeding is then very apt to occur, and in several of the cases in the accompanying list this has actually taken place.

(5) *Treatment of the Wounds.*—These cases are not, of course, amenable to aseptic treatment, but that is no reason why one should not be as careful as possible not to introduce any fresh septic material, and I am therefore as careful about the disinfection of the skin, instruments, hands, &c., as if the wound could be kept aseptic, and I have been surprised at the remarkable freedom from any general or marked local sepsis in the majority of my cases. It is very much the fashion to rub in iodoform and to plug these wounds with iodoform gauze, but I am not a great believer in the virtues of iodoform as an antiseptic, and cannot attribute the absence of sepsis to its employment. Sir Joseph Lister recommends the application of a 10 per cent. watery solution of chloride of zinc to the wound immediately after the operation, and no doubt it is useful. I believe, however, that the best safeguard against septic troubles is the avoidance of fresh infection at the time of the operation, and the free drainage of

the cavity, and possibly, as I have already hinted, to some extent the removal of the internal jugular vein.

As a preparation for these operations, it is most important to see that the teeth are repeatedly and thoroughly scrubbed, and to order the patient to use a frequent gargle of pretty strong Condy's fluid or sanitas. After the operation I have usually packed the wound for 24 hours with cyanide gauze powdered with iodoform, so as to stop the oozing of the blood, and to prevent the surface becoming covered with clots which would decompose. This is withdrawn on the day after the operation, and is not re-introduced, but as soon as the patient can manage it, he is instructed to frequently fill his mouth with weak sanitas or Condy and let it run out of the tube. After the operation, the skin incisions are stitched up and a large drainage tube is fixed at the most dependent part of the wound, and passing freely into the pharynx. This tube is left untouched for two days, and is afterwards taken out once or twice a day and washed in 1 to 20 carbolic acid before being re-introduced. I generally keep it in for about ten days altogether. Free drainage of the wound is a point of paramount importance. I think that the remarkably smooth progress of the naso-pharyngeal cases was due to the ease with which the discharges were able to flow away from the wound; and in these, as well as in the other cases where the larynx is not touched, I arrange very soon for the patient to be propped up, more or less completely, in a sitting posture. As an external dressing, I use cyanide gauze, which is as easily employed as anything else, and which has the advantage of arresting the decomposition which is going on in the discharges which pass into it.

I have already referred to the tracheotomy tube, and need not say anything further about it. The feeding of the patient is, of course, a point of great importance. Difficulty in swallowing naturally varies in different cases, according to the extent of the operation and the parts removed. In severe cases, where a great part of the pharynx has been taken away, the stomach tube must, of course, be used, and I generally leave one in at the time of the operation for three or four days, and then pass it whenever necessary, taking care that it glides along the healthy side of the pharynx and does not impinge on the granulating surface. In one of the cases, No. 26, the patient began to swallow about the

second day, using a plan suggested by Dr. Semon, namely, hanging the head over the side of the bed with the sound side downwards, and then taking the fluid into the mouth. As a result, it ran down the sound side, and the patient was able very soon to manage quite well. In other cases we have had to use the stomach tube for a considerable time. In No. 38, where a portion of the tongue, tonsil, and pharynx were taken away, one of the most extensive of the operations, the patient began to try to swallow about the tenth day, but he was not able to swallow a sufficient quantity to dispense with the feeding tube till about three weeks after the operation. Much depends also on the closure of the sinus left by the drainage tube, but the finger placed over that while swallowing is going on is usually sufficient to prevent the fluid running out. In the case where the epiglottis and the base of the tongue were removed, it was seven days before he could swallow at all, and between three and four weeks before he could swallow comfortably. Israel states that in the epiglottis operations, the rapidity with which the power of swallowing is regained is much expedited by stitching back the tongue to the mucous membrane over the lower part of the epiglottis, which he preserves if possible. I did not do this in my case, as I had to remove the epiglottis completely, and I think that in few instances of carcinoma of the epiglottis can it be advisable to leave any of the mucous membrane behind. In all of these cases I have combined rectal alimentation with the other for some time.

A few words as to subsequent operations for recurrence. In only one of my successful pharyngeal cases has there as yet been a local recurrence, and on that I have operated. The question of a second operation would entirely depend on the situation and the extent of the recurrence, but one must not assume that having done one large operation any further recurrence is hopeless. Hence I would strongly advise frequent inspection of these cases, at any rate for the first year, so as to be able to detect the first trace of recurrence, and to remove it if possible. A subsequent thorough removal must, however, always be difficult on account of the amount of cicatricial tissue which is present. Judging from a study of the cases in the accompanying list, glandular recurrence is looked on as a very serious matter, but this is a view which, as I have already said, I cannot at all share. To my mind, glandular recurrence, unless it has been neglected and attained a very con-

siderable size, is a comparatively small matter, and I can only repeat that I consider the great advantage which operative treatment in this region possesses over operations elsewhere, is that we have a very extensive glandular area accessible, and that recurrences can be removed very easily. The great difficulty about glandular recurrences is where they take place in the site of the former wound, that is to say in the midst of cicatricial tissue, and this is one of the reasons for the great stress that I have laid on very complete removal of the whole glandular area which is exposed in our incisions. If this area is thoroughly removed, then subsequent glandular recurrence outside the scar tissue is readily enough dealt with. There are very few structures in the neck that cannot be dispensed with, and even if the glandular enlargement has been neglected, if it is only possible to get it away and leave the essential structures behind, that is to say, the vagus and phrenic nerves and the internal carotid artery, it is, I think, a pity, after an extensive throat operation, to leave the patient to his fate. In case No. 112, I removed glands on the left side eight months after the original operation, and as yet there is no further recurrence there, and, I think, further glandular recurrence is improbable on that side, seeing the wide area of healthy material which I was able to take away.

(6) *Results.*—I must now say a few words about the results, as shown in Table III. This Table has been pretty thoroughly analysed at the end, but some explanation is needed, as the bare figures do not at all convey an accurate impression of the results. We must also consider the results in the three great groups separately. In Group A we have operations of varying severity, some quite small, but the majority of considerable extent, some indeed, such as my case of sarcoma of the tonsil (No. 22), very extensive; but the great point of distinction between this group and the next is that the wound in the throat did not communicate with a wound in the neck. Group II comprises the cases which essentially belong to this subject, and in it are included all the cases where the wound in the throat communicated with a wound in the neck. This group I have broken up into three divisions, according to the seat of the disease, viz.:—(1) The upper part of the pharynx with the tonsillar region as the central point; (2) disease at a lower level, in the pharynx proper; (3) cancer of the epiglottis. In Group III we have to do with a

very much more serious condition, where the disease is not confined to the pharynx, but has spread on to and involved the larynx, or *vice versâ*. I shall, in the first place, consider the question of mortality, and then the results as regards cure or benefit, and as regards function.

(*a*) *Mortality.*—In Group I there were 23 cases with two deaths, or 8·6 per cent. mortality, one death being from pyæmia (No. 13), and one from exhaustion after hæmorrhages and recurrence of the disease (No. 9). As regards risk to life, therefore, cases of this class are quite satisfactory. In Group II also the mortality is less than one would expect considering the great severity and extent of these operations, the total result being 91 cases with 27 deaths, or a mortality of 29 per cent. Of the divisions of this group the highest mortality is found in B, where the disease affected the pharynx at a lower level than the tonsillar region, these cases numbering 15 with six deaths, or 40 per cent. mortality. The smallest mortality is in Division C, cases of removal of the epiglottis, where there was one death in six cases, or a mortality of 13·3 per cent. In the main division of this group (A), the tonsillar cases, there were 20 deaths in 70 cases, or a mortality of 28 per cent. Considering the nature of the operations, this cannot be regarded as an excessive mortality, but if we look into the causes of death we shall find that some of them should be avoidable in future. Thus six of the 20 cases died from hæmorrhage (Nos. 24, 25, 38, 41, 51, and 53), four of these after ligature of the external carotid artery, one of the common carotid, and one from hemiplegia after ligature of the common carotid for hæmorrhage. A seventh case also died from hemiplegia from ligature of the internal carotid at the time of the operation. In my case also (No. 40) the ligature of the carotid had much to do with the patient's death, and possibly this may also have been the case in No. 39. Thus in eight or nine of the 20 deaths the cause lay in interference with the large vessels. This is a valuable lesson, and it seems to me that in this respect the mortality in future ought to be distinctly reducible. Of the 20 deaths, eight or nine had also to do with septic trouble, chiefly septic pneumonia. How far we can reduce this cause of death in future it is difficult to say; preliminary tracheotomy is not, as I have already pointed out, an absolute safeguard against this accident. In the total 91 cases belonging to Group II, at least 15 deaths were due to septic

causes = 16·4 per cent. Although this occurrence is, I fear, in some cases unavoidable, still I think much can be done to prevent it, and I look forward to a reduction of the mortality from this cause also. On the whole, therefore, I believe that if the lessons derived from a study of the work done in this department of surgery are borne in mind, there will be a marked reduction of the mortality in future. One difficulty in improving the results, both as regards mortality and also as regards the eradication of the disease, has been the limited experience of individual surgeons owing to the small number of cases operated on, and to the hopeless view which is generally taken of them by those who see them first. I was much struck with an expression used in one paper with regard to Billroth's great mortality after pylorectomy, that it represented the "Lehrgeld," or educational expenses of the operation. In these pharyngeal operations, individual surgeons have had so little opportunity of operating, that their efforts may be looked on as altogether "Lehrgeld," and we have not yet got beyond the educational stage. I hope that the lessons derived from a study of this table of cases which I have collected will enable us in future to pass the educational period; and in that case it is certain that the mortality will fall, and the success will increase in these as it has done in other operations. Even with the present mortality, however, these operations are fully justified, and occupy as good a position as many others which are looked on as perfectly legitimate procedures.

When we come to Group III, we find a much more serious state of matters, for here of 58 cases, 32 died, giving a mortality of 55 per cent. Of these, the chief cause of death was septic pneumonia, which led to 19 of the 32 deaths, that is to say, of the total number operated on, 32·7 per cent. died of septic pneumonia. How far this might be reducible in future is a difficult question, but I think considerable improvement would follow from freeing the divided end of the trachea and stitching the skin all round it so as to isolate it altogether from the pharynx.

(*b*) *Ultimate Results.*—In the whole list of cases there are only four which come under the class cured, that is where three years have elapsed without recurrence, but more may have now passed that limit, for as a rule the cases have been published soon after the operation and there are no further notes of them. Thus it happens that of the 114 cases in the first two groups, no fewer

than 24, or, including operations after recurrences, 30, are marked H ?, that is to say, they recovered from the operation, but the further history, at any rate after six months, is not recorded. Some of these may have been cured, or, at any rate, a considerable time may have elapsed before recurrence. Similarly, 14, or, including operations after recurrences, 17, are marked H, that is to say, a considerable period had elapsed since the operation without recurrence. It is, therefore, very difficult to arrive at definite conclusions as to the ultimate result in these operations, but I have attempted to do something in this way, by estimating the cases which were benefited and those which were not, the estimate in both instances, especially in those benefited, showing, however, the worst result. Under those "not benefited," I have placed those which died or recurred early; under "benefited," those which recurred late, or which remained well at the last note, more than six months after the operation. Those marked H ? do not come under either group, but most probably, if the further result were known, they would decidedly increase the number of those "benefited," hence, as I say, the latter class is certainly considerably under-estimated, especially in Group II. Letting it stand so, however, we find, as summarised at the end of the Table, that in Group I 30 per cent. were not benefited, 52 per cent. were benefited, and 18 per cent. remains which we cannot classify; in Group II, 54 per cent. were not benefited and 17 per cent. were, while as many as 29 per cent. have to be left out of consideration: in Group III, 81 per cent. were not benefited and 12 per cent. were, while only 7 per cent. are unclassified.

In considering the value of these operations we must take into account the mortality, and we must also remember that we are still in the educational period. As I have already said, I feel sure that with this accumulated experience before us, the mortality can be considerably reduced, certainly in the second group, and possibly also in the third; while there is undoubtedly much scope for greater care and thoroughness in operating, more especially as regards the glands, some of the operations, as will be evident, having been very imperfectly performed. Hence, I look forward not only to less mortality, but also to distinct improvement as regards recurrence. As regards Group I, there can be no question as to the advantage of operation, but with regard to it I would point out that several of the cases would have had a much better

chance had the operation been more extensive, and had they thus come into Group II; and in several of those benefited the result was due more to good luck than to good management. I hope the favourable results shown in this group will not induce surgeons to treat cases in this way which ought to be more thoroughly dealt with. As regards Group II, I think the result is encouraging, for a mortality of 29 per cent., and a mortality which is evidently reducible, is not such as to deter us from giving these patients a chance. Here the present results are that 54 per cent. were not benefited, but that is not more than in many statistics of breast cancer, and not so much as in rectal and intestinal cancer, which are generally recognised as suitable cases for operation. Of these cases the most unfavourable are those where the disease has spread on to the tongue, and it is in these instances that most cases of septic pneumonia have occurred, the numbers being 36 cases where the tongue was involved, with 12 deaths, or 33 per cent., of which seven were from septic pneumonia; four of these 12 deaths were, however, from hæmorrhage and were probably avoidable.

It is where the tongue is extensively involved in addition to the pharyngeal disease that we come, I think, to the limits of these operations. I do not feel, however, able at the present time to lay down definite limits beyond which it is not advisable to proceed. So much depends on the experience and the personal equation of the individual operator. Almost all my cases have been condemned by other surgeons as quite inoperable, and I believe all would have been so condemned had they been seen, and yet not only have three done well, but even two out of the three who died were very nearly successes, and instead of discouraging us give us hope for the future.

When, however, we come to Group III, we have a very different state of matters, for not only is the mortality very high (55 per cent.), but the proportion of those who cannot be reckoned as having got any benefit is very large (81 per cent.). I think, therefore, that in most of these cases the patients will be better off if left alone, at the same time, in a small proportion (12 per cent.) benefit was obtained, and, therefore, I would not necessarily exclude all these cases from operation, but would leave it to the surgeon to judge in the individual case whether an operation is feasible or not.

As to the functional result in the first two groups, it is for the

most part quite satisfactory. It is remarkable how much one can take away in the tonsillar region without causing any great contraction or inconvenience; on the other hand, where pharynx and larynx are both removed, life is hardly worth living except in rare instances, certainly it is not in the case of a poor patient, who would have to spend the remainder of his days in the workhouse.

3. Intestinal Cancer.

I had intended to have made some remarks about excision of the larynx, and Dr. Lack has taken much trouble in collecting cases for me, but time fails me to touch on it, nor can I do much in reference to cancer of the intestinal tract; but I must just say a few words about it, as the operative problems differ in that region from those which we have been considering. Cancer of the intestinal tract is, in itself, more than sufficient for the whole three lectures, and my only reason for introducing any remarks on the subject here is because the point of view from which one regards it is in marked contrast with that in the two situations which I have been dealing with. I think the points of distinction will be sufficiently evident if I confine my remarks to the rectum.

Up till now I have been speaking of cancer in parts where practically the only object in operation was with the view of curing the disease, but here we have a region where, on the one hand, the conditions as regards cure are not so favourable, while on the other, alternative procedures have to be considered which, while they do not aim at cure, often prolong life markedly, and what is more, remove a great deal of the agony of the disease. In cases of intestinal cancer we have to do with a disease which, as elsewhere, varies much in malignancy, but is on the whole less malignant than cancer in the situations which we have been considering. More especially is this true as regards the glandular and metastatic deposits, in which the disease sometimes progresses very slowly, and if only the risks attending the situation of the primary disease can be avoided, the patient may, in the less malignant forms, live for a very considerable time. In accordance with this lesser malignancy, recurrences after operation are not uncommonly late, a considerable proportion taking place after several years. Thus in Czerny's statistics, 10 were well after three years, but four of these (40 per cent.) subsequently showed

disease. Metastases are also late in occurring, and as regards the latter point, Iversen states that in 47 *post-mortem* examinations of long-standing cancer of the rectum (he does not say of how long-standing), he found 21 in which there were no metastases. As regards the hope of cure, however, the glandular area is not nearly so accessible as in the breast or the throat, and therefore, when the disease is of the rapidly advancing form, there is little chance of getting beyond it by operation. Hence the radical operation cannot be so thorough, and were it not for the fact just mentioned as to the lesser malignancy of the disease, chances of benefit by removal of the disease would be very slight. Further, the operations necessary for the removal of the primary disease, more especially where it is high up, are accompanied by a considerable mortality. And lastly, the functional result after operation often leaves much to be desired, both as regards continence on the one hand, and stricture with its troubles on the other. On the contrary, we have in colotomy an alternative procedure which removes the immediate risk to life (obstruction), and thus prolongs life often very considerably, while it also rids the patient of much of his pain and discomfort, by relieving the impending obstruction and by getting rid of the inflammatory condition at the seat of disease, which not only adds much to the patient's discomfort, but also no doubt increases the rapidity of growth of the disease.

Thus we have in these cases a choice of procedures, and it is no longer, as in the former instances, a question of a radical operation or nothing; and further, as the palliative procedure offers much relief, and as only a small proportion of radical operations give any hope of permanent benefit, there is not the same urgent need for radical operation. Hence the question of selection of cases and our mode of advising the patient is much altered. We shall find that in a large proportion of cases the hope of benefit from a radical operation is so very slight that we can without hesitation exclude them from the radical procedure, and at the same time help them much by colotomy; and thus the cases in which the choice of an operation has to be left to the patient are comparatively few. We can, in most instances, say definitely that the case is suitable for the one or the other procedure; there are only a few on the border line that we need leave to the patient to decide.

I cannot enter here into the question of the operative procedures, but I may say that while the perineal operation is suitable in some cases, in the majority it is best to employ one or other of the methods which give good access to the part from behind, such as Kraske's sacral operation, or one of the modifications of it. Where the disease is situated pretty high up, the favourite plan is, after removal of the affected portion, to try to unite the upper and the lower part, and obtain again continuity of the canal. In some few cases this has succeeded very well, and the patient has had more or less perfect control over the evacuations, but in most instances there has been incontinence more or less complete; in some, fistulæ have been present in addition, and in many an amount of stricture has resulted, which has been a source of great suffering to the patient. In some cases, also, where there has been much tension, the bowel has given way, and extravasation of fæces has occurred and led to fatal cellulitis, or peritonitis. If there is incontinence in these cases, the anus is a very difficult situation to keep clean, or to fit with any suitable apparatus; hence where there is much tension, I think it is much better to bring the end of the rectum out in the sacral region, where it can be much more easily kept clean, and in that case one should remove the anal portion altogether, so as not to leave a canal to infect the deeper part of the wound. In the last case on which I operated, I removed the whole of the lower part of the rectum, and applied a ligature around the bowel just above where it was cut off, brought this ligatured portion out in the sacral region, stitched it to the skin, brought together the wound, and left the ligature around the bowel, and in this way for four days we had an aseptic wound. It was not until the end of the fourth day that the ligature cut through and a communication formed with the bowel, and though a small part of the wound in the neighbourhood opened up and suppurated, the greater portion, and especially all the deeper part, remained healed. Where the anus is brought out in this situation, some advantage as regards continence is gained by acting on Gersuny's suggestion to rotate the bowel through an angle of 90°.

Let us contrast the results after colotomy with those after excision. At one time colotomy was of itself an operation with a considerable mortality, and when performed during an attack of obstruction it is so still. At the present time, however, especially as regards inguinal colotomy, the mortality is quite insignificant

when performed apart from obstruction—probably not more than 2 per cent. or 3 per cent., if indeed so much. We may, in fact, disregard the primary mortality of colotomy, and study the results as regards prolongation of life. There are not many good statistics on this point. Erckerlen's old statistics give 45 cases surviving the operation, of whom 22, or 49 per cent., died within a year, and 23, or 51 per cent., lived more than a year, six, or 13 per cent., living over two years. Bryant's statistics are much more favourable. Of 70 cases operated on without obstruction, only 18, or 25 per cent., died within a year, 26, or 34 per cent., died between 12 and 24 months, 16, or 22 per cent., died between 24 and 36 months, and 12, or 17 per cent., were still alive when he wrote. Of 55 which survived the operation for obstruction, 18, or 32 per cent., died in the first year, 19, or 34 per cent., in the second, 12, or 21 per cent., in the third year, and six were still alive, three of them having lived from two and a half to five years after the operation, and one of them alive after six years. Taking the whole 125 cases together, we find that 36, or 28 per cent., died during the first year, 43, or 34 per cent., died during the second year, 28, or 22·4 per cent., died later than two years, and 18 were still alive when he published, some of them also having lived more than two years. These results are, however, remarkably favourable, much more so than any other published estimate. The explanation may, in part at any rate, be that at the present time in a good many of these cases, the disease would have been excised, and only the more advanced and malignant cases would have been subjected to colotomy. At the present time, therefore, cases treated by colotomy do not live, on an average, nearly so long, most of them dying during the first and second year. In a case unsuitable for the radical operation, however, I performed colotomy nearly five years ago, and the patient is still alive, although in the interval a small communication has formed with his urethra.

Let us turn now to the results of the radical operation. The mortality varies considerably between the perineal and the sacral operations, being naturally higher for the latter. Konig's total mortality is 38 per cent., Billroth's 34 per cent., Kocher's 28 per cent., Albert's 18 per cent., Iversen's estimate as regards the Kraske operation 25 per cent., and Czerny with the perineal operation 5·4 per cent., with the sacral operation 19·4 per cent. So far as one can judge from a large number of reports, the

mortality after the perineal operation seems to be about 8 per cent., after the sacral operation from 18 per cent. to 20 per cent., but the results vary much in the hands of different surgeons, probably in accordance with the selection of cases and the after treatment of the wounds, and in both instances it can in all likelihood be somewhat reduced in the future. As matters stand, however, we have to contrast colotomy, in which the mortality is practically nil, with excision, where the mortality varies from 5 to 20 per cent.

Let us next consider the results, and I shall not weary you with elaborate statistics, but take as examples three papers in which the cases are detailed, and which, therefore, I have been able to control and work out myself. I had intended to inflict another Table on you, and my friend, Dr. Macan, has spent a good deal of time in hunting up results for me, but as I found that I had no time to go at all fully into the matter, I gave up the project.

1. Kocher's statistics, as given by Arndt, show 35 cases of radical operation with 10 deaths, a mortality of 28 per cent. Excluding the last three years, as we did in the breast, we have 25 cases with seven deaths (28 per cent.), 11 recurrences (44 per cent.), and seven without recurrence (28 per cent.). In four of the recurrent cases, however, marked benefit was obtained, for two were again operated on and remained well three and eight years subsequently, while in two the recurrences were very late, three and five years respectively. The seven which did not recur had been free for $3\frac{11}{12}$, $5\frac{10}{12}$, $6\frac{7}{12}$, $8\frac{11}{12}$, $13\frac{1}{4}$, $16\frac{4}{6}$, and $16\frac{1}{2}$ years. To summarise this result, 14, or 56 per cent., did not benefit by the operation, while 11, or 44 per cent., did benefit to a marked degree.

2. Take Czerny's statistics as given by Heuck and Loewinsohn (I do not include Schmidt's report, because most of his cases are too recent). These statistics do not include any sacral operations; 41 cases, three deaths (7 per cent.), 21 early recurrences (51 per cent.), eight late recurrences from 17 months up to five and a half years (16 per cent.), four well over six years (9 per cent.), two died within the first year without recurrence. Thus there was no benefit in 24 cases (58 per cent.), and marked benefit in 14 (34 per cent.).

3. Konig's statistics, as given by Hildebrand, represent perineal and sacral operations, and comprise 54 cases with 21 deaths (38 per cent.). Leaving out the last three years, we have 34 cases

with 17 deaths (50 per cent.), six early recurrences (17 per cent.), five late recurrences (12 per cent.), three remained well for from three and three-quarters to five years (8 per cent.), and the remainder cannot be classified. The total is 23 not benefited (67 per cent.) and eight benefited (23 per cent.). Of five apparently well for three years, two subsequently recurred (40 per cent.).

We may say, therefore, that of these 100 cases 61 were no better off than if they had been left alone, and not so well off on the whole as if they had had colotomy done, for 27 of them died at once. These results are not in any way better, indeed not so good as in the pharynx operations. On the other hand, 33 gained advantage, and most of them very marked advantage, from the radical operation, much greater than colotomy could have given. From this we see that of every 100 cases subjected to the radical operation in Germany only about 35 are really likely to be benefited by the operation, and 60 would be better off if left alone or with colotomy, for in Germany the radical operation is carried to an extreme extent, adhesion to bladder and prostate not even forming a contra-indication; indeed, Genzmer goes so far as to advocate the operation even though there are already metastatic deposits in the liver. As even in Germany, about 20 per cent. to 25 per cent. of the cases applying for relief are not deemed fit for the radical operation, we may say that, taking all patients together as they come to the surgeon, not more than 20 per cent. will be benefited by the radical operation; the remainder will do better left alone or with colotomy. If we study the successful cases, it appears that in the great majority of instances where real benefit was derived from the operation, the disease was low down and was not adherent to surrounding structures: the cases of success as regards prolonged freedom from recurrence where the disease was high up or adherent to surrounding structures such as the prostate, are quite few in number. In this matter I quite agree with the tendency of the English school of surgery as opposed to the German, and would exclude from the radical operation cases of rapid growth; cases where the disease forms large masses in the intestine or is deeply ulcerated; cases where it has passed through the wall of the rectum and invaded surrounding parts, as indicated by fixidity; and rapidly growing tumours high up, even though not yet fixed. In none of these is there any real prospect of cure, or of marked prolongation of life. In the fixed tumours, local recurrence is

almost certain to take place early, and the last condition of the patient will be worse than the first; where the tumour is rapidly growing, glandular infection is widespread and the chances of getting beyond the disease are very remote, while, on account of the rapidity of growth, the glandular disease and the metastatic deposits will soon end the life of the patient. In none of these cases is it worth while for the patient to run a considerable risk, for it is just in these cases that the mortality is highest, while in colotomy, performed when necessary, we have a means of relieving the patient's sufferings and of giving him as long a period of life with practically no risk.

The conditions higher up the intestinal canal, as met with in practice, are still more unfavourable for radical operation, both as regards the chances of freedom and the risk, but, nevertheless, in a good many instances extirpation has been carried out with distinct advantage. The various methods of intestinal anastomosis, however, present an excellent substitute, and as the mortality of this operation has markedly decreased of late, only really favourable cases need be subjected to the radical operation.

I must, however, bring these remarks to a close. I am well aware how far my effort has fallen short of the aim I set before me, or of what is due to this Society. I have tried to point out that by thorough removal of the disease a considerable proportion of cases may remain free from recurrence for a long time or altogether, and to emphasise the point that if real benefit is to be conferred by operation on sufferers from cancer, we must not only look at the visible disease, but must also take into account the probability of its dissemination and the paths along which it may have spread. We must, in fact, look on the primary disease, the lymph channels leading from it and the first chain of lymphatic glands as, so to speak, one complete organ, which must in most cases be rooted out if the patient is to be freed from his trouble. If such operations are done at all they must be done thoroughly, and the ultimate result depends on the thoroughness with which all traces of disease are taken away. The Biblical exhortation, "Whatsoever thy hand findeth to do, do it with all thy might," is as applicable to surgery as it is to all other matters of life.

TABLE I.

All the cases of Cancer of the Female Breast since 1890 (*verified by Microscopical Examination*), *in which the first Operation was performed by* MR. WATSON CHEYNE.

A.—CASES WHERE 3 YEARS AT LEAST HAD ELAPSED SINCE THE OPERATION.

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
1	52	21/1/90	2 years ...	Nodule, size of walnut; numerous small hard glands	Usual	No	No	Well, 6 years later. CURED.
2	47	11/2/90	2 years ...	Large tumour, glands small, marked cachexia	Usual	?	Abdominal swelling developed 9 months after operation. Died 21 months after operation	
3	40	25/3/90	1 year ...	Large tumour, above and internal to nipple, adherent to skin and muscles. Glands	Usual and portion of pectoral muscle	In 6 months. Nodules on rib	Probably mediastinal growth,	
4	38	20/5/90	2 months ...	Largish mass above nipple A good many glands	Usual	No	No	Well, 5 years 9 months later. CURED.

A.—Cases where 3 years at least had elapsed since the Operation—*continued.*

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
5	50	4/11/90	Paget's Eczema 2½ years. Tumour in breast noticed for 6 months	Elongated mass external to nipple, adherent to skin; nipple retracted, flattened and eczematous. Glands in axilla	Usual...	No	No	Well, 5 years and 3 months. CURED.
6	47	14/2/91	2 years ...	Tumour adherent to skin; glands affected, but not very large	Usual...	No	No	Well, 5 years. CURED.
7	49	24/2/91	9 months ...	Marked general enlargement of breast. Extensive glandular affection. Marked cachexia; very bad case	Usual. Very large amount of skin removed. Skin grafting	No	Lungs. Died in about 18 months	
8	33	24/3/91	1 year ...	Large mass in outer side of breast. Large glands. Very weak. Cachexia.	Usual. Large amount of skin. Skin grafting	Small nodule in skin near angle of scapula Excised, 24/3/92. No further local recurrence	Masses in abdomen (? ovary). Died, 17/2/93	
9	52	31/3/91	Nearly 2 years	Ulcerated tumour below and outside nipple. Glands enlarged but not big	Usual...	No	No	Lived 3 years and 5 months, then died of acute bronchitis. No return. CURED.
10	46	22/10/91	Some months	Diffuse. Skin involved. Glands. Nodules found in fat on operating	Usual...	Recurrence in skin in 8 months	Died of cancer of pleura, 14 months after operation	
11	63	23/10/91	18 months ...	Small, diffuse tumour. Glands	Usual...	No	No	Well, 4 years and 3 months. CURED.

12	44	3/11/91	6 months ...	Large mass in breast. Glands: one large one	Usual. Glands removed from portion; triangle	Recurred ?	... ...	Well, 2 years and 2 months later; recurred and has been again under treatment elsewhere last year.
13	56	27/11/91	3 years ...	Size of hen's egg. Glands considerably enlarged. Atrophic scirrhus	Usual...	No	No	Well, 4 years and 2 months. CURED.
14	62	9/12/91	3 years ...	Gland a good deal shrivelled, skin adherenr, not ulcerated; numerous small hard glands. Atrophic scirrhus	Usual...	No	No	Well, 4 years and 1 month. CURED.
15	49	11/12/91	10 months ...	Tumour, size of pigeon's egg, on outer side of nipple. Adherent skin. Glands affected, but not very large	Usual...	No	No	Well, 4 years and 1 month. CURED.
16	59	15/3/92	9 months ...	Large mass over upper and outer quadrant. Skin adherent and red. Glands	Usual, but very extensive removal of skin at the outer part	No	No	Well, 3 years and 10 months. CURED.
17	63	31/5/92	2 years ...	Large mass towards axillary part of breast, adherent to skin. Glands	Usual...	No	Deposit in lower part of spine. Much pain in back and leg. Died 21 months after operation	
18	43	27/9/92	6 months ...	Extensive hardness of upper and outer quadrant. Enlarged glands in axilla and puckering of skin over the lower ones. Glands in supraclavicular fossa; very bad case	Usual, but very extensive. Glands removed from above clavicle	Local reeurrence. Seen about a year afterwards. Inoperable		
19	42	12/12/92	3 months ...	Mass in upper and outer quadrant. Skin puckers but is not involved. Glands involved but not large	Usual; a good many glands affeeted	No	No	Well, 3 years and 1 month. CURED.

A.—Cases where 3 years at least had elapsed since the Operation—*continued*.

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
20	57	7/1/93	4 months. Cyst (in degenerating cancer?) opened and drained by another surgeon	Diffuse soft cancer of breast; a good many glands. Sinus leading into the breast. Skin adherent all over; very bad case	Extensive operation; portion of pectoralis major removed	Recurred in lower remaining part of pectoralis; about 18 months later, removed; again recurred towards upper part of axilla and removed. Now again recurred at root of neck, and inoperable. Still alive		
21	43	21/2/93	Nearly a year	Tumour involving greater part of breast and adherent to skin and deeper parts. Glands infected but not large	Usual, and part of pectoralis major	No	No	Well, almost 3 years. CURED. (Still well, May, 1896.)

Total, 21 cases. No deaths from the operation.

12 cured, *i.e.*, well for more than 3 years.

9 recurred { 5 external recurrences, 3 of them with metastatic deposits as well.
1 recurrence (? external).
3 metastatic deposits without external recurrences.

In percentages 57% cured, 42·8% recurred.

The patients "cured" have lived 6 years, 5 years 9 months, 5 years 3 months, 5 years, 4 years 3 months, 4 years 2 months, 4 years 1 month (2 cases), 3 years 10 months, 3 years 1 month, 3 years; one died—well, 3 years and 5 months after the operation.

B.—CASES WHERE 3 YEARS HAVE NOT YET ELAPSED SINCE THE OPERATION.

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
22	47	19/4/93	Glands first noticed 4 months ago, then found tumour in breast	Extensive mass in centre of breast. Glands in axilla enlarged	Usual...	In 4 months. Died 10 months after operation		
23	60	1/5/93	7 months; rapidly increasing	Large mass in upper and outer quadrant of the breast. Puckering of skin. Extensive glandular enlargement	Usual, and sternal origin of pectoralis major and the pectoralis minor	Recurred 3 months later in skin around and developed into a cancer *en curiasse*		
24	76	9/5/93	6 months ...	Large mass in axillary portion of breast, adherent beneath. Glands	Usual, and part of pectoralis major	No	Died 6 months later of intestinal obstruction. (? Tumour in abdomen.) No post-mortem examination	
25	62	17/7/93	2 years ...	Large hard mass beneath left nipple, adherent to skin and parts behind. Glands in axilla	Usual, and part of pectoralis major	... ...	... ...	Cannot trace case.
26	47	11/10/93	Has had some induration of breast since a blow six years ago. For last 2 years, noticed increase	Hard mass in inner half of breast, adherent to skin. Enlarged glands in axilla.	Usual. Had to skin graft part of incision	No	No	Well, 2 years and 3 months.

B.—Cases where 3 years have not yet elapsed since the Operation—*continued.*

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
27	50	4/11/93	Some months	Diffuse hardness of upper part of breast. Glands	Usual...	No.	No	Well, 2 years and 3 months. In September, 1884, there was a good deal of swelling of the arm, and as it did not go down I opened up the axilla in November, but found no disease.
28	45	27/12/93	2 months ..	Lump below and external to nipple ; skin not involved. Glands	Usual, and lower part of pectoralis major	... ...	... ...	Lost sight of.
29	69	24/1/94	15 months ...	Mass size of orange behind and to inner side of nipple. Skin adherent and red. Mass in axilla. As it turned out an inoperable case	Usual, and pectoralis major. Was unable to remove axillary mass as it extended high up and involved all the structures	Recurred locally and in axilla within a year		
30	52	7/3/94	6 months ...	Mass below and internal to left nipple ; adherent to skin. Glands in axilla	Usual...	No	No	Well, 1 year and 11 months.
31	48	7/3/94	2 years ...	Upper and inner quadrant of right breast. Small lump adherent to skin and pectoral. Glands in axilla	Usual, and portion of pectoralis major	No	No	Well, 1 year and 10 months.
32	45	21/3/94	1 month ...	Mass behind nipple. Marked retraction. Skin adherent. Glands	Usual...	No	No	Well, 1 year and 10 months.

3	41	1/4/94	?	Diffuse mass behind nipple. Skin adherent Mass of glands in axilla	Usual, and piece of pectoralis major	No	Shortly afterwards began to complain of pain in the back and limbs, and gradually got weaker, and died about 15 months later. Probably recurrence in vertebræ. No post mortem.	
31	47	18/5/94	3 months ...	Mass in middle of breast. Glands in axilla	Usual...	.. ..	... ...	Died immediately after the operation. The ether led to a great secretion of mucus, and she seemed quite unable to get it up, and was very blue. I think she died chiefly of ether leading to filling of the bronchi with mucus which, owing to her collapsed condition, she was unable to cough up.
35	54	22/5/94	2 years ...	Large mass above left nipple. Skin adherent. Numerous glands in axilla	Usual, and portion of muscle	No	No	Well, 1 year and 8 months.
36	58	26/5/94	Cyst tapped 6 years ago. Some thickening remained. 6 months ago lump began to grow.	Large mass in upper and inner quadrant of left breast. Skin adherent. Glands in axilla and above clavicle	Usual, and a good deal of pectoral muscle and glands above clavicle	A year later further glands in neck removed. In September, 1895, recurrence in connection with inner end of fifth rib removed. Still very well, but recurrence over rib.		

B.—Cases where 3 years have not yet elapsed since the Operation—*continued*.

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
37	54	30/7/94	6 months ...	Large diffuse mass on outer side of left breast. Skin adherent. Numerous small hard glands	Usual, and piece of pectoralis major	No	No	Well, 1 year and 6 months.
38	58	29/8/94	5 months ...	Mass, size of hen's egg, in lower and outer part of left breast. Several nodules extending towards axilla, and enlarged glands there adherent to skin and muscle	Usual, and lower part of pectoralis major	On 24/4/95 a subcutaneous nodule over edge of latissimus dorsi removed	Later recurred in abdomen. Died about 14 months after operation.	
39	About 50	6/10/94	9 months ...	Tumour in upper part of left breast. Some small glands	Usual...	No	No	Well, 1 year and 4 months.
40	62	17/10/94	4 years ...	Mass in upper part of right breast. Skin adherent and ulcerated. Several small glands	Usual and piece of pectoralis major	No	No	Well, 1 year and 3 months.
11	34	6/2/95	8 months ...	Hard mass on outer side of right breast. Adherent to skin and muscle. Enlarged axillary glands	Usual, and a good deal of the pectoralis major	No	While recovering from the operation she complained of much pain in her back (sacral region) and on enquiry we found that she had suffered from this for 4 months. She gradually lost flesh and died, after having much pain in the back, 6 months after the operation. Probably spinal deposit.	

42	48	17/4/95	5 months ...	Diffuse hardness on outer side of left nipple with retraction of nipple and much puckering and adhesion to the skin. Enlarged glands	Usual, and lower part of pectoralis major	No	No	Well, 9 months.
43	50	5/6/95	4 years ...	Atrophic scirrhus on right side. Skin adherent but not ulcerated. Glands slightly enlarged	Usual...	No	No	Well, 7 months.
44	38	5/6/95	5 months ...	Mass in upper and outer quadrant of left breast, adherent to skin and slightly to deeper parts. Glands small	Usual...	No	No	Well, 7 months.
45	54	14/6/95	3 months ...	Mass in outer and lower quadrant of left breast. Skin adherent Glands enlarged	Usual...	No	No	Well, 7 months.
46	45	19/6/95	6 months ...	Tumour in left breast. Skin adherent Glands small	Usual...	No	No	Well, 7 months.
47	46	3/7/95	10 months ...	Mass in outer side of right breast. Adherent to skin and also deeply. Glands enlarged	Usual, and portion of pectoralis major	No	No	Well, 6 months.
48	49	10/7/95	6 months ...	Mass on outer side of breast. Adherent to skin which is red. Enlarged glands	Usual...	No	Probably ...	Died March, 1896, of "cough and weakness," probably recurrence.
49	58	16/7/95	3 weeks ...	Mass on outer side of left breast. Adherent to skin. Enlarged glands	Usual...	No	No	Well, 6 months.
50	44	16/7/95	1 year ...	Mass in lower and outer part of left breast. Small glands	Usual...	No	No	Well, 6 months.
51	About 50	23/7/95	1 year ...	Hardness behind nipple and on outer side. Puckering of skin. Enlarged glands	Usual...	No	No	Well, 6 months.
52	51	29/7/95	18 months ...	Mass in outer side of left breast. Adherent to skin and pectoralis. Glands	Usual, and piece of pectoralis major	Nodules on ribs Jan. 1896; inoperable.		

B.—Cases where 3 years have not yet elapsed since the Operation—*continued.*

No.	Age.	Date of Operation.	Disease noticed for about—	Seat and Extent.	Nature of Operation.	Results up to February, 1896.		
						External Recurrence.	Metastatic Deposit.	No Recurrence as yet.
53	56	21/8/95	2 months ...	Mass in outer part of right breast. Small glands	Usual...	No	No	Well, 5 months.
54	55	3/9/95	18 months ...	Largish mass in lower part of left breast. Marked glandular enlargement	Usual...	No	No	Well, 4½ months.
55	? 60	3/9/95	2 years ...	Atrophic scirrhus in left breast. Small glands	Usual, and a good deal of pectoralis major	No	No	Well, 4½ months.
56	45	26/9/95	6 months ...	Large mass in left breast, extremely anæmic. Great menorrhagia. Glands: Probably metastasis	Usual, and most of pectoralis major and minor	No	Healed well, but became gradually weaker, and died 3 months later. Nodules could be felt in abdomen. No doubt cancerous	
57	59	13/10/95	Some months	Diffuse mass above left nipple adherent to skin. Large glands in axilla. Bad case	Usual...	No	No	Well, 3 months.
58	55	16/10/95	7 months ...	Tumour in lower and inner quadrant of left breast, adherent to skin, and slightly to deeper parts. Enlarged glands	Usual...	No	No	Well, 3 months.
59	47	3/11/95	9 months ...	Small cancer in breast. Small glands	Usual...	No	No	Well, 2½ months.
60	39	28/11/95	6 months ...	Tumour diffuse, especially at upper part of right breast. Numerous glands. Bad case	Usual..	No	No	Well, 2 months.

61	32	5/12/95	3 weeks ...	Small cancer at axillary end of left breast. One enlarged gland. Quite early case. Very bad family history	Usual...	No	No	Well, 1½ months.

Total number of cases where 3 years has not yet elapsed since the operation = 40, of these—

1 died of the operation.
2 have been lost sight of.
26 have had no recurrence as yet.
11 have shown further disease { 6 recurred locally; in one (No. 29) visible disease left behind. 5 had metastatic deposits alone; one of these (No. 56) was really an inoperable case, and in two cases (Nos. 24 and 48) I only assume that there were internal deposits.

In percentages, 65% remain well, 27·5% recurred.

The total is 61 cases. In 38, no recurrence = 62%. In 20, recurrences or metastatic deposits = 32%.

Excluding the cases operated on during 1895, which may be said to be too recent, we have 40 cases, of which—

21 remained well = 52%.
16 have shown further signs of cancer = 40%; one of these (No. 29) was really inoperable, and in one (No. 24) I am not sure whether there was a deposit or not.
2 lost sight of.
1 died after operation.

One other interesting calculation is to follow those cases which lived for a year after operation without further sign of cancer, thus showing the chances of a patient where a year passes without recurrence = 25 (including 2 recurrences about which I am not sure), of these—

20 remain well.
1 died—well after more than 3 years.
4 showed further signs of cancer (Nos. 7, 12, 17, 20), but in two of these (Nos. 7 and 17) the recurrence may have been noticed before the end of the first year.

This shows that the chance of recurrence is very slight if a patient is absolutely well after a year.

Table II.

Statistics of Breast Operations.

Operator.	Total Cases.	Mortality.	Known Recurrences or Deaths from Metastases.	Cures.	Cases done more than 3 years before the Report.				—
					Total.	Mortality.	Recurrences (or Metastatic Deposits).	Cures.	
Fischer (Henry)	147	20%	55%	8%	86	22%	59%	15%	13 cures.
Esmarch (Oldekop)...	229	10%	44%	10%	171	13%	(?)	14%	25 cures.
Before 1863	—	—	—	—	47	—	—	4%	2 ,,
After 1863	—	—	—	—	124	—	—	18%	23 ,,
Rose (Fischer)	61	26·3%	(?)	6%	—	—	—	—	4 cures.
Billroth (Winiwarter)	143	23·7%	62%	5%	89	22%	68%	9%	8 cures.
Trendelenburg (Neuendorff)	97	11%	54%	2%	50	12%	68%	4%	2 cures.
Lücké (Dietrich)	110	7·6%	(?)	9%	69	8%	60%	13%	9 cures.
Czerny (Schmidt)	150	4·4%	(?)	5%	82	6%	46%	8·5%	8 cures.
Krönlein (Horner)	144	4%	58%	18%	121	4%	68%	20%	25 cures.
Küster (Schmidt)	222	10·8%	(?)	9%	132	14%	(?)	15%	20 cures.
König (Hildebrand)	135	—	—	17%	118	9%	61%	20%	23 cures.
Bergmann (Eichel)...	114	4·3%	62%	11%	43	7%	62%	30%	13 cures.
Mitchell Banks	82	12%	26·8	21·9	—	—	—	—	18 cures.
Halsted	50	0	43%	4% or 8%	11	0	54%	18-36%	2-4 cures.
Watson Cheyne	61	1·6%	32%	19·9%	21	0	42·8%	57%	12 cures.

Table III.

Operations for Malignant Disease of the Pharynx collected, as far as possible, up to the end of 1895.

Group I.—Cases where the disease was removed from the mouth, with or without splitting the cheek, and with or without tracheotomy, where in fact there was no wound in the neck communicating with the mouth.

a. Carcinoma.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
1	Newman. (1890) "Malignant Diseases of Throat and Nose"	M 65	Epithelioma of left tonsil, uvula and posterior pillar of fauces, noticed 4 weeks. No glands	Removed through mouth with thermo-cautery under cocaïne	Recovered	Still remains well, 6 years later, therefore CURED. (Private communication)
2	Wolff. (1889) 'Berl. Klin. Wochnschr.,' 1891, p. 401	M 45	Carcinoma of left tonsil and neighbouring part of velum and pharynx	Head dependent. Removed from mouth. Half soft palate removed, tumour cut round and peeled out with finger	Recovered	Well 1¼ years later.
3	Körte. (1885) Referred to by Wolff, as above	M 51	Carcinoma of left tonsil and soft palate	Removed with head dependent	Recovered	3 months later gland removed from right side of neck and 7 months later one from left side. Remained well till 6 years and 4 months after operation, when recurrence in glands above left clavicle. No local recurrence.

Group I—*continued*.

a. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
4	McIntyre. (1891) 'Journal of Laryngology,' 1893	M 60	Epithelioma of left tonsil and lower part of anterior pillar of fauces	Removed with seissors through mouth	Recovered	No recurrence 21 months later.
5	Watson Cheyne. (1892)	M 52	Epithelioma of left anterior pillar of the fauces spreading on to tonsil and towards tongue	Clipped out	Recovered	Patient cannot be traced.
6	Newman. (1891) "Malignant Diseases of Throat and Nose"	M 51	Epithelioma of tonsil and soft palate. No glands	Tracheotomy, and five days later removal with electro-cautery through mouth	Recovered	Still remains well, therefore CURED (5 years). (Private communication.)
7	Lauenstein. 'Deutsche Med. Wochnschr.,' 1888	M 65	Carcinoma of soft palate and upper part of anterior pillar of fauces	Tracheotomy. Right cheek split, soft palate, and anterior pillar of fauces removed	Recovered. Cannula removed next day	No further history.
8	MacEwen. (1878) Quoted by Newman	M 55	Epithelioma of right tonsil, side of pharynx and tongue	Incision from angle of mouth to angle of lower jaw and tumour removed. No further details	Recovered	Well 12 years later. Cured.
9	Kendal Franks. 'Lancet,' 1884, vol. i	M 45	Ulcerating carcinoma of left tonsil, soft palate, and base of tongue, with enlarged glands	Cheek split. Tongue removed by galvano-cautery, and then soft palate and tonsil by thermo-cautery. Gland removed later	Hæmorrhage on 8th and 14th days. Death from exhaustion after two months. Recurrence in floor of mouth	
10	Kocher. (1886) 'Langenbeck's Archiv,' vol. 45	M 64	Carcinoma of the mucous membrane between the jaws, spreading on to soft palate, anterior pillar of fauces and side of tongue. No glands	Removal, after splitting cheek, without performing tracheotomy or dividing jaw	Recovered	Gland found and removed a fortnight later No further history.

11	Weeks. (1889) 'Trans. Amer. Surg. Assoc.,' 1892	M 70	Epithelioma (?) of side of tongue, fauces, and left tonsil	Cheek split and affected parts clipped out	Recovered	Died a year later. No cause given. (? Recurrence.)
12	Watson. (1894) 'New York Med. Journ.,' 1894	F 53	Epithelioma (?) of left tonsil and anterior pillar of fauces. Enlarged gland	Freely removed by cautery knife. (? Gland)	Recovered	Well three months later.
13	Velpeau. Quoted from Stappert's Thesis, "Das Carcinom der Tonsille," 1889	M 68	Epithelioma of tonsil and pharynx	Ligature laid round common carotid, mouth opened, soft palate split, and tumour got out	Died in 17 days of pyæmia.	

β. Sarcoma.

14	McIntyre. (1892) 'Journal of Laryngology,' 1893	F 58	Sarcoma of left tonsil, anterior and posterior pillars of fauces	Clipped out	Recovered	Recurrence in right tonsil 6 months later. No further operation.
15	Newman. (1884) "Malignant Diseases of the Throat and Nose"	F 57	Spindle-celled sarcoma of left tonsil. No glands	Tracheotomy; removed through mouth piecemeal	Recovered	Remained well 5 years; then developed round-celled sarcoma in right tonsil, and rapidly died.
16	Lediard. (1887) 'Lancet,' 1889	M 62	Lympho-sarcoma of right tonsil	Tracheotomy; tumour clipped out through mouth	Recovered	Nine months later glandular recurrence removed. Well a year later.
17	Michaux. 'Bull. de l'Acad. Med. Roy. de Belgique,' 1886-87 Quoted by Bosworth: "Diseases of Throat and Nose"	M 45	Tumour (? sarcoma) involving left half of soft palate, and extending to pharynx and nares. Observed for 4 months	Excised through mouth. Recurred in one month, and then cheek split and growth with part of hard palate removed	Recovered	Recurred in 2 months. Inoperable.
18	Conner. (1888) 'New York Med. Rec.,' 1889	M 40	Sarcoma of tonsil size of man's fist	Cheek split and tumour enucleated	Recovered	Recurred in 2 months, and died in 4 months after operation.
19	O'Hara. 'Australian Med. Journ.,' 1892	M ?	Sarcoma of left tonsil involving left half of soft palate and root of tongue. No glands	Tracheotomy. Cheek split and tonsil pulled out and clipped away. Surrounding tissue destroyed with thermo-cautery	Recovered	Remained well 4 years; then died, sarcoma of lung. No local recurrence.

GROUP I—*continued.*

β. Sarcoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
20	Barker. 'Path. Soc. Trans.' 1886	F 74	Lympho-sarcoma of right tonsil and gland	Removed gland. Cut around tonsil with thermo-cautery, and shelled it out. Removed nodule from tongue	Recovered	3 weeks later second nodule in tongue removed. Rapid recurrence in glands, and died 6 months after operation.
21	Croly. (1886) 'Jonrnal of Laryngology,' 1887	M 17	Round-celled sarcoma of left tonsil involving soft palate. Gland enlarged	Growth excised through mouth and gland removed	Recovered	Rapid recurrence in palate and neck, and death in 6 months.
22	Watson Cheyne. (11/9/94) (*See* Lecture II)	M 42	Round-celled sarcoma of right tonsil, side of pharynx, soft palate, and lower part of naso-pharynx; glands	Glands removed and external carotid tied; cheek split and disease removed partly from inside and partly from outside	Recovered	Mass of glands removed 8 months later, and again in beginning of April, 1896. Well 16 months after first operation. No local recurrence. (Patient still well, May, 1896.)
23	Gardner. 'Australian Medical Journal,' 1892	M 62	Sarcoma of left tonsil, pillars of fauces, and up to soft palate; ulceration in central part	Laryngotomy. Pharynx plugged, cheek incised from angle of mouth to masseter. Growth cut away	Recovered	14 months later growth in axilla, but no local return.

Group II.—Cases of disease in the Pharynx where the internal wound communicated with an incision in the neck.

A.—Where the disease was situated in or in the vicinity of the tonsils, and extended thence to the neighbouring parts.

1.—Where the jaw was not divided. *a.*—No Tracheotomy.

a. Carcinoma.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
24	Polaillon. 'Gazette Méd. de Paris,' 1885	M 37	Epithelioma of right tonsil, slightly on soft palate and base of tongue	Ligature of lingual and right common carotid. Incision from angle of mouth to wound. Lateral pharyngotomy. Removal by galvano-cautery and thermo-cautery of base of tongue, tonsil, &c.	Died. Bleeding 1½ months after operation, and common carotid tied. Death in a few hours. There was local recurrence. Paralysis followed ligature of common carotid.	
25	Polaillon. (1883) 'Gazette Méd. de Paris,' 1886	M 65	Epithelioma of left tonsil, spreading on to soft palate and base of tongue	Ligature of external carotid. Incision from angle of mouth to incision in neck. Removal by galvano- and thermo-cautery	Died. Hæmorrhage on 14th day, and again on 16th, from external carotid; latter fatal.	
26	Watson Cheyne. (13/10/94) (*See* Lecture II)	M 55	Epithelioma of left tonsil, anterior pillar of fauces, and soft palate, very large mass of glands extending under sterno-mastoid, and adherent to vessels	Removal of glands with internal jugular vein. Ligature of external carotid. Lateral pharyngotomy. Removal of mass, partly from inside and partly from outside	Recovered	Well 15 months later. (Still well, May, 1896.)
27	Kocher. (1881) 'Langenbeck's Archiv,' vol. 45	M 49	Carcinoma of right tonsil, soft palate, anterior pillar of fauces and side of tongue	Cheek split and tumour removed by external and internal incisions	Recovered	Recurred in a little over a year.

Group II. A.— *continued.*

1.—Where the jaw was not divided. *a.*—No Tracheotomy.

a. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
28	Thorburn. (1889) 'Brit. Med. Journal,' 1890	? ?	Epithelioma of right tonsil, and soft palate, of both alveoli and base of tongue. Gland in neck	Removal by pharyngotomy	Recovered	Recurred in palate 6 weeks later. Removal. Well 2½ months later.
29	Fowler. 'Journal of Laryngology,' 1888	F 67	Carcinoma of left tonsil. Glands in neck	Tied lingual and facial arteries. Opened pharynx by cautery, and removed tonsil. Glands shaved off carotid	Recovered	Died, 8 months later, of gastric ulcer. Glandular recurrence in both parotid regions.

β. Sarcoma.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
30	Wheeler. 'Dublin Journal,' 1884	F ?	Spindle-celled sarcoma in right sinus pyriformis starting from stylo-hyoid ligament	Lateral pharyngotomy. Removal of tumour piecemeal. No special arrangements for exposing the tumour	Recovered	Recurred locally in 3 months. Further attempt at removal failed. Death from exhaustion.
31	Cheever. 'Boston Medical and Surgical Journal,' 1869, p. 54	M 34	Sarcoma of tonsil (left), ulcerated. Glands enlarged	Incision along border of jaw. Removal of glands. Division of digastric, stylo-hyoid and stylo-glossus. Pharynx opened. Tumour removed	Recovered after 31 days.	
32	Homans. (1890) 'Lancet,' 1891, vol. 2	F 59	Round-celled sarcoma of right tonsil	Incision outside; tonsil clipped out from mouth	Recovered	Well 5 months later.
33	Raymond Johnson. (1892) 'Lancet,' 1893, vol. 1	F 53	Lympho sarcoma of tonsil and glands in neck	Glands removed from neck. Pharynx exposed from neck. Ligature of external carotid. Tonsil clipped out	Recovered	Recurrence in glands; removed a month later, and again 6 months later. No local recurrence.

34	Chavasse. (1892) 'Lancet,' 1893, vol. 1	? ?	Alveolar sarcoma of left tonsil; glands at angle of jaw. Thumb previously removed for sarcoma	Oblique incision from ear to hyoid bone, conneeted with one from angle of mouth	Recovered	No recurrence 14 months later.

b.—Tracheotomy.

a. Carcinoma.

35	Koeher. (1875) 'Deutsche Zeitschr. f. Chirurg.,' 1880	M 53	Carcinoma of left tonsil spreading on to soft palate and base of tongue; glands	Glands removed first. Eight weeks later, removal of primary mass, including common carotid, great cornu of hyoid bone, posterior part of tongue, soft palate, tonsil, and side of pharynx	Recurred immediately, and 4 weeks later second operation, followed by death from septic pneumonia	On 6th day, after first operation, embolism of left retinal artery.
36	Charters Symonds. 'British Medical Journal,' 1888	M 45	Epithelioma of anterior part of tonsil, extending on to floor of mouth, cheek, and gum. Submaxillary gland affected	Cheek split. Removal of tonsil, part of soft palate, pharynx and tongue, by clipping; gum peeled off	Reeovered	Reeurred in 3 months, and again excised with part of jaw. Seeond recurrence and operation. Third recurrence and death.
37	Küster. (?) (1884) From Meyer's Thesis, "Beiträge zur Statistik der Zungen Carcinome," 1888	M 50	Carcinoma of back of right side of tongue, spreading on to pharynx up to the neighbourhood of the inferior maxillary joint; glands	Gland removed. Cheek split. Removal of disease. Jaw not divided	Recovered	Died of recurrence 2½ months later.
38	Watson Cheyne. (12/6/95)	M 44	Epithelioma of right tonsil, base of tongue, floor of mouth, soft palate, and side of pharynx. Glands	Removal of glands and ligature of external carotid. Cheek split to masseter. Lateral pharyngotomy. Disease removed in ono mass (part of tongue, tonsil, half soft palate, part of wall of pharynx)	Did well, and was able to be up and feed himself, when, on July 7th (25 days after the operation), there was a sudden hæmorrhage from the external carotid, which choked him before assistance could be obtained.	

Group II. A.—*continued.*

1.—Where the jaw was not divided. *b.*—Tracheotomy.

a. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
39	Watson Cheyne. (1/7/95)	M 56	Epithelioma of tongue, tonsil, soft palate and side of pharynx on right side. Glands in neck	As in former case (38), but in addition the internal carotid was firmly involved in the growth, and as the patient was very collapsed it was left for 4 days and then removed	Went on well for 4 days, then removal of diseased internal carotid. That evening signs of septic pneumonia, and next day also of paralysis of left side, and death on sixth day	
40	Watson Cheyne. (23/7/95)	M 55	Epithelioma of the posterior part of the right half of the tongue, tonsil, half of soft palate, side of pharynx and glands in neck	Ligature of external carotid and removal of glands. A week later tracheotomy, upper part of wound re-opened, and primary mass excised	After the second operation patient suffered from post-operative mania, and it was a most difficult thing to feed or do anything with him. Otherwise he went on well till 8th day, no fever, &c. On 11th day slight hæmorrhage, common carotid tied by a colleague. Two days later complete hemiplegia on opposite side and ultimately death on the 31st day after operation. Softening of right part of brain and abscess in lung	
41	Milligan. (1892) 'Journal of Laryngotomy,' 1893	M 49	Epithelioma of left tonsil, palatine arches, part of soft palate, and small piece of hard, posterior third of tongue. Glands	Incisions along jaw from symphysis and oblique one thence to sterno-mastoid. Parts removed	Died of hæmorrhage from common carotid on 27th day	

42	Dupage. (1895)	M 52	Cancer of lower part of pharynx and œsophagus	Subhyoid pharyngotomy and vertical incision. Pharynx divided above tumour and parts removed. Œsophagus sutured to skin	Recovered.
43	Dupage. (1895)	M 53	Epithelioma on right side of upper part of pharynx	Tracheotomy, lateral pharyngotomy, removal of disease	Died on 10th day of post-operative mania

2.—Where the jaw was divided.

a.—No Tracheotomy.

a. Carcinoma.

44	Heinecke. (1877) From Kranefuss's Thesis, "Ueber einen Fall von Retropharyngealem Carcinom"	M 51	Carcinoma of tonsil, soft palate and side of pharynx	Removal of portion of lower jaw and of disease. Wound left open in middle	Healed after plastic operation	No further result given.
45	Albert. (1878) 'Wiener Med. Presse,' vol. 19	M 58	Carcinoma of lateral pharyngeal wall recurring after removal of parts through mouth with scissors	Division of jaw and removal of remains of tonsil and posterior pillar of fauces	Healed	No further result given.
46	Mikulicz. (1883) 'Deutsche Med. Wochnschr.,' 1886	F 65	Epithelioma of tonsil, pharynx, base of tongue, soft palate and glands	Lateral pharyngotomy and removal of ascending ramus of jaw from in front of angle	Recovery	Recurred within 2 years locally and inoperable. Bad functional result.
47	Mikulicz. (1883) 'Deutsche Med. Wochnschr.,' 1886	M 61	Carcinoma of tonsil, soft and hard palate	Same as above, but failed to entirely remove disease	Death in 2½ hours from collapse and blood in trachea.	
48	Polaillon. (1882) 'Gaz. Méd. de Paris,' 1886	M 43	Epithelioma of left tonsil spreading on to anterior pillar of fauces, soft palate and base of tongue. Glands in neck	Removal of glands and ligature of external carotid. Incision from angle of mouth to join vertical one. Tumour removed by galvano- and thermo-cautery	Recovery. Violent hæmorrhage on 10th and 11th days	Died of recurrence during the year.
49	Trendelenburg. (1888) From Stappert's Thesis, "Das Carcinom der Tonsille," 1889	M 37	Carcinoma of right tonsil reaching down to larynx, involving half of soft palate and base of tongne. Glands	Incision dividing middle of lower lip and along lower border of jaw to angle. Removal of disease including right half of tongue. No ligature of external carotid	Recovered and discharged in a month. Bleeding not severe	No further result.

Group II. A.—*continued.*

2.—Where the jaw was divided. *a.*—No Tracheotomy.

a. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
50	Polaillon. (1884) 'Gaz. Méd. de Paris,' 1886	M 41	Carcinoma of half soft palate, tonsil, side of tongue and floor of mouth on left side. Glands	Ligature of external carotid. Incision from angle of jaw to the neck incision. Removal by galvano-cautery	Recovery. Hæmorrhage on next day, and on 3rd day very profuse. Stopped by plugging and ligature	Recurrence in 2 months, and death in 8 months.
51	Polaillon. (1885) 'Gaz. Méd. de Paris,' 1886	M 55	Epithelioma of left lower gum, floor of mouth and extending on to pharynx. Gland	Ligature of external carotid. Division of lower jaw and removal of mass by thermo-cautery	Hæmorrhage on 4th day and rapid death, probably from external carotid, the ligature being destroyed by the cautery.	
52	Polaillon. (1886) 'Gaz. Méd. de Paris,' 1886	M 70	Epithelioma of right tonsil, soft palate, pillars of fauces, and base of tongue	As above	Died, septic pneumonia, on 3rd day.	
53	Weinlechner. (1886) 'Aerztl. Ber. des k. k. Allgemein. Krank. zu Wien,' 1888, p. 208	M 60	Ulcerated tumour of right tonsil, soft palate and anterior pillar of fauces. (? Carcinoma)	Incision from angle of mouth, resection of jaw, &c.	Severe bleeding 3rd day. Ligature of common carotid, followed by hemiplegia in 3 hours, and death in 17 hours.	
54	Küster. (?) (1884) Meyer's Thesis, "Statistik der Zungen Carcinome," 1888	M 28	Carcinoma of base of left side of tongue, extending on to pharynx. Gland	Both linguals tied. Jaw sawn through and disease removed. Much blood lost and some entered trachea	Recovered	Recurred quickly, and patient died 11 months after operation.
55	Küster. (?) Meyer's Thesis	M 39	Carcinoma of base of left side of tongue, anterior pillar of fauces and epiglottis	Removal of more than half the tongue, half the epiglottis and hyoid bone, left tonsil, pillars of fauces, and left side of floor of mouth	Recovered	Recurred quickly, and died 9½ months after operation.

56	Rushton Parker. (1876) 'Med. Times and Gazette,' 1877, p. 590	M 58	Epithelioma of left side of tongue, lower jaw, and cheek	Cheek split, body of jaw removed, half the tongue, part of each jaw, submaxillary gland, side of pharynx and part of soft palate	Recovered	Recurred in glands, on right side, 6 years later, and subsequent death.
57	Rushton Parker. (1877) 'Med. Times and Gazette,' 1877, p. 590	M 54	Epithelioma of soft palate, fauces, gum, and floor of mouth	Cheek split and piece of jaw removed. Removal of half tongue, half of soft palate, side of pharynx and submaxillary glands	Recovered	Recurred in glands, attempt to remove them failed. Death 5½ months after operation.
58	Lange. 'New York Med. Journ.,' 1891	? ?	Epithelioma of left wall of pharynx, tonsil, soft palate, and submaxillary gland	Cheek split, and jaw divided near angle. Affected parts excised	Recovered	Swallows well. No further history.
59	Kocher. (1883) 'Langenbeck's Archiv f. Klin. Chirurg.,' vol. 45	M 49	Recurrence *in situ* after removal of carcinoma of right tonsil, &c. *See* Case 27	Extensive removal of affected parts	Recovered	No further history.
60	Kocher. (1885) 'Laugenbeck's Archiv f. Klin. Chirurg.,' vol. 45	M 57	Carcinoma of anterior pillar of fauces, soft palate, tonsil, side of pharynx, and base of tongue. Glands	Excision of diseased portion of jaw and affected parts	Recovered	No further history.
61	Barker. (1885) 'Lancet,' 1887	M 55	Epithelioma of tonsil and side of pharynx, slightly on hard and soft palates, on side of tongue, and on lower jaw behind molar	Cheek split, ascending ramus of jaw removed. Half soft palate, mucous membrane on hard; side of pharynx and part of tongue removed	Recovered	Recurred in six months, and died 3 months later.
62	Watson Cheyne. (Oct. 1895)	M 55	Recurrence *in situ* after removal of epithelioma of tonsil, palate, tongue, &c. *See* Case 84	Removal of ramus of jaw and internal pterygoid muscle, pterygoid plates, part of masseter and temporal muscles, scar tissue. Nitric acid applied to cut surfaces	Recovered. On the 9th day, nitric acid sloughs separating and hæmorrhage from internal carotid, which was tied above and below, without any bad result	Patient died of "inanition" at the end of February, 1896.
63	Dupage. (1894) 'Journal of Laryngology,' 1895	M 52	Epithelioma of right tonsil, soft palate, and lateral wall of pharynx. Many glands	Glands removed and external carotid tied. Pharynx exposed by Mikulicz's method, and affected parts removed	Recovered	Well 8 months later.

Group II. A.—*continued.*

2.—Where the jaw was divided. *a.*—No Tracheotomy.

β. Sarcoma.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
64	Cheever. 'Philadelphia Med. News,' 1889	M 57	Round-celled sarcoma of left tonsil. Two glands in neck	Glands removed. Jaw sawn, and tumour taken away	Recovered	Recurred in glands in anterior triangle. Removed. No further report.
65	Trendelenburg. (1882) Jardon's Thesis, "Ueber Tonsillengeschwülste," 1883	M 49	Malignant lymphoma of right tonsil extending into soft palate and on to wall of pharynx. Large mass in neck at angle of jaw	Removal by lateral pharyngotomy and division of jaw	Recovered	Recurrence locally 6 months later, and also nodules over the body.
66	Weeks. (1891) 'Trans. American Surgical Assoc.,' 1892	M 57	Very large ulcerated left tonsil (? sarcoma) filling fauces. Glandular masses in neck	Glands removed, jaw divided, tonsil removed	Recovered	Well a year later.
67	V. Winiwarter. 'Archiv f. Klin. Chirurg.,' vol. 18	M 62	Malignant lymphoma of right tonsil pushing aside uvula, extending on to angle of lower jaw and side of pharynx. Mass in anterior triangle	Removed after resection of the jaw	Died on 2nd day.	
68	Genzmer. 'Deutsche Gesellschaft f. Chirurg.,' 1879, vol. 8	M ?	Sarcoma of tonsil	Division of jaw. Removal of tonsil, part of soft palate, whole of right, and half posterior pharyngeal wall	Recovered	Well 2¾ years later.

b.—Tracheotomy.

a. Carcinoma.

69	Bergmann. (1883) 'Deutsche Med. Wochnschr.,' 1883	F 62	Carcinoma of tongue, tonsil, and side of pharynx; right side. Glands	Removal of tongue (only a very small piece left on left side), piece of jaw, floor of mouth side of pharynx, submaxillary glands, and lymphatic glands. Plastic 3 weeks later	Recovered	Well 107 days after operation.
70	Mikulicz. 'Deutsche Med. Wochnschr.,' 1886	M 42	Carcinoma of whole side of pharynx and half soft palate, going high up to base of skull. Glands	Removal of ascending ramus of jaw. Failure to remove the upper part of growth	Recovered. Went out in 6 weeks	Continued growth.
71	Mikulicz. (1894) 'Langenbeck's Archiv f. Klin. Chirurg.,' 1895	M 55	Carcinoma of right tonsil, spreading on to soft palate down to base of tongue, reaching upper jaw, and upwards into post nasal space. No glands	Incision along anterior border of sterno-mastoid, and then from angle of mouth to middle of this. Ramus of jaw removed behind. Tumour removed	Recovered	No further history.
72	Helferich. (1890) Barthauer's Thesis, "Ueber Malignen Pharynxtumoren," 1891	F 61	Epithelioma on left side of pharynx, soft palate spreading on to hard palate, tonsil, pillars of fauces, side of pharynx as low as larynx, and on to tongue	Tracheotomy. Subhyoid pharyngotomy; cheek split from angle of mouth to other incision, jaw divided, and ramus removed. Tumour taken away, also piece of hard palate. Tumour reached up to base of skull, and was there peeled off, and the surface cauterized with thermo-cautery	Died, on 6th day, of septic pneumonia.	
73	Küster. (1884) 'Deutsche Med. Wochnschr.,' 1885	M 61	Epithelioma of left tonsil, soft palate, pharynx and tongue, and mucous membrane over angle of jaw up to upper jaw. Glands	Incision from angle of mouth to sterno-mastoid. Jaw sawn in front of masseter. Posterior part disarticulated. Growth removed	Died, on 7th day, of septic pneumonia and mediastinitis.	
74	Küster. (1885) 'Deutsche Med. Woehnschr.,' 1885	M 49	Epithelioma of left tonsil and side of pharynx on to side of tongue, and soft palate to near uvula	Jaw sawn through as in 73, and ramus removed. Removal of growth. No glands removed	Recovered. Functional result good	Recurred in lymphatic glands. Removal 5 months later. No further history.

Group II. A.—*continued.*

2.—Where the jaw was divided. *b.*—Tracheotomy.

a. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
75	Kocher. (1879) 'Deutsch. Zeitschr. f. Chirurg.,' 1880	M 45	Excision of tongue in May of same year. In October, recurrence over lower jaw in front of masseter, from this an ulcerated mass down to hyoid bone, inside of cheek, on to soft palate, tonsil, and whole side of pharynx up to naso-pharynx	Angular incision laying bare side of jaw and neck. Branches of carotid and jugular tied. Left half of lower jaw removed, and all the growth and remains of tongue	Recovered	Recurrence 9 weeks later. Inoperable.
76	Kocher. (1876) 'Deutsch. Zeitschr. f. Chirurg.,' 1880	M 53	Carcinoma on left side of tongue (ulcerated) extending on to fold between the jaws, up to the tonsils, and on to soft palate as far as uvula	Jaw divided at anterior border of masseter. Incision along anterior border of sterno-mastoid and along jaw. Wound left open. Tracheotomy tube left in 5 days	Recovered. Still small fistula. Nonunion of jaw	9 months later, removal of glands. Well 3 years later.
77	Kocher. (1875) 'Deutsch. Zeitschr. f. Chirurg.,' 1880	M 52	In May, removal of whole left half of tongue. Recurrence in January, adherent to jaw, reaching to hyoid bone and in stump of tongue	Removal of piece of jaw, tumour, great cornu of hyoid bone and stump of tongue	Recovered	Died of recurrence a year later.
78	Kocher. (1876) 'Deutsch. Zeitschr. f. Chirurg.,' 1880	M 56	Epitheliomatous ulcer of base of left side of tongue, extending on to side of pharynx, and up to hard palate. Glands	Jaw divided in front of masseter and posterior part removed. Disease cut away	Died on 5th day from septic pneumonia.	

79	Kocher. (1881) 'Langenbeck's Archiv f. Klin. Chirurg.,' vol. 45	M 23	Carcinoma of left side of tongue, anterior pillar of fauces, tonsil and pharynx	Division of jaw and removal of disease	Died after 36 hours of septic pleurisy.	
80	Braem. (1894) 'Langenbeck's Archiv f. Klin. Chirurg.,' 1895	M 58	Carcinoma of left tonsil and side of pharynx, extending on to mucous membrane between the jaws and over angle of lower jaw and posterior pillar of fauces, soft palate to border of hard and down close to base of tongue. Glands	Incision along anterior border of sterno-mastoid. Glands removed. Then from angle of mouth to middle of this. Jaw removed from in front of masseter. Mass removed. Trendelenburg cannula left for 24 hours, and ordinary cannula for 7 days	Recovered	No recurrence 6 months later. Functional result good.
81	Albert. 'Wiener Med. Presse,' vol. 19	M 27	Recurrence after removal of carcinoma of right upper jaw and extension to pharynx; affecting pharynx, lower jaw, cicatrix of upper, &c.	Removal of tissue replacing right upper jaw and part of left, the right side of the pharynx, almost all the right side of the lower jaw and glands	Recovered (?)	Further recurrence, and death soon afterwards.
82	Dupage. (1895) 'Journal of Laryngology,' 1895	M 53	Carcinoma of both tonsils and all posterior wall of pharynx	External carotid tied, Mikuliez's method; whole pharynx and epiglottis removed	Recovered in spite of pneumonia, diarrhœa, cystitis, &c.	Well 4 months after operation.
83	Lack. (1895) Not published	M 54	Epithelioma of left tonsil, soft palate, slightly on to hard, and slightly on to lateral wall of pharynx, on to lower jaw and adjoining part of cheek. Glands in neck	Glands removed, external carotid tied, incision along sterno-mastoid and thence along lower border of jaw. Flap raised, jaw divided close to second molar and ramus excised. Pharynx opened and mass clipped out	Went on well for 3 weeks and parts looked well. Died suddenly, cause not discovered. (?Septicæmia.)	
84	Watson Cheyne. (26/7/95)	M 55	Epithelioma of tongue, tonsil, soft palate, side of pharynx, gum of lower jaw at back and glands in neck on left side	Removal of glands and ligature of external carotid. A week later tracheotomy, division of jaw and removal of affected portion with half the tongue, the tonsil, half the soft palate, &c.	Recovered	Recurred $2\frac{1}{2}$ months later locally. *See* No. 62.

Group II. A.—*continued.*

2.—Where the jaw was divided. *b.*—Tracheotomy.

β. Sarcoma.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
85	Mikulicz. 'Deutsche Med. Wochnschr.,' 1886	M 28	Sarcoma of tonsil spreading on to pharynx, almost filling it up, and up to choanæ	Mikulicz's operation. Tracheotomy	Healed	Died, 3 months later, suddenly. Cause not known.
86	Obalinski. 'Centralblatt f. Chirurgie,' vol. 14	M 49	Sarcoma of right side of pharynx and tonsil, involving pillars of fauces and soft palate. Glands	Removal of glands. Resection of jaw. Removal of tumour	Recovered in 5 weeks. Function good	No further note.
87	Kümell. 'Deutsche Med. Wochnschr.,' 1888	M 28	Sarcoma of right tonsil, pillars of fauces, and part of pharynx, developing after removal of a large sarcomatous mass from the neck	Lateral pharyngotomy. Jaw sawn through. Cheek split	Recovered. Tracheotomy tube removed on 4th day	No further note.
88	Czerny. (1877) 'Beiträge zur Operativ. Chirurg.,' 1878, p. 64	M 34	Lympho-sarcoma of left tonsil, soft palate. Wall of pharynx ulcerated. Mass felt at angle of jaw	Division of jaw. Removal of tumour. Suspicious part left in pharyngo-palatine fossa	Recovered	Recurred, and second operation 2½ months after first. Died on 7th day of hæmorrhage from lingual artery.
89	Macleod. (1880) 'Glasgow Med. Journ.,' 1880	F 53	Round-celled sarcoma of palate and side of pharynx	Jaw split at symphysis. Tumour shelled out with fingers	Died 2nd day. Lung trouble.	
90	Cheevers. (1878) 'Boston Med. and Surg. News,' 1878	M 37	Tumour (sarcoma?) of right tonsil passing middle line, and growing rapidly. Glands	Glands removed. Jaw divided, and tonsil enucleated with fingers	Recovered	Local recurrence in a month cauterized. Further recurrence and death.
91	Roswell Park. (1878) 'Medical Record,' 1893	M 58	Round-celled sarcoma of left tonsil, and soft palate, ulcerated. Glands	Glands removed. Jaw divided. Gland and tumour removed	Recovered	Well 2½ years later.

92	Roswell Park. (1891) 'Medical Record,' 1893	M 31	Sarcoma (?) of right tonsil extending into and blocking naso-pharynx. Glands on both sides of neck	Jaw divided. Common carotid and internal jugular tied	Died 4 days later.	
93	Lanphear. (1894) 'New York Med. Journ.,' 1895	? ?	Sarcoma of right tonsil recurring rapidly after simple removal, filling up pharynx. Mass in neck. Facial paralysis	Tracheotomy. 3 days later division of jaw, external carotid tied, and mass in neck and mouth removed. Internal carotid wounded and tied	Died, 3 days later, hemiplegia. Never recovered consciousness.	

B.—Where the pharyngeal disease was at a lower level than the tonsillar region, or at any rate did not involve it.

a. Cacrinoma.

94	Heineke. (1878) Kranefuss's Thesis	M 54	Medullary carcinoma of posterior wall of pharynx	Division of jaw. Removal of mass	Death in 4 weeks—pneumonia.	
95	v. Bergmann. From Iversen	M 58	Cancer of lower part of pharynx and upper part of œsophagus	Removed	Died, 5 days later, from suppuration in neck, and mediastinitis.	
96	Israël. 'Berl. Klin. Woch.,' 1883	M 64	Cancer in left side and anterior wall of pharynx	Tracheotomy 3 days previously. Oblique incision. Subhyoid pharyngotomy, and tumour removed easily	Died, 7 days later, from suppuration between trachea and œsophagus, and septic pneumonia.	
97	Iversen. 'Langenbeck's Archiv f. Klin. Chirurg.,' vol. 31	F 34	Epithelioma of posterior wall of pharynx, extending slightly on to left wall	Tracheotomy. Subhyoid pharyngotomy	Recovered	Recurred, and 5 months after operation, tracheotomy and gastrostomy. Died a month later.
98	Iversen. 'Langenbeck's Archiv f. Klin. Chirurg.,' vol. 31	F 51	Epithelioma of posterior wall of pharynx at level of entrance of larynx	Tracheotomy. Subhyoid pharyngotomy	Recovered	Recurred 6 months later. Inoperable.
99	Iversen. 'Langenbeck's Archiv f. Klin. Chirurg.,' vol. 31	F 48	Epithelioma of posterior wall of pharynx and œsophagus	Tracheotomy. Subhyoid pharyngotomy	Recovered	Recurred 4 months later.

Group II. B.—*continued.*

a. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
100	Cramer. (1889) 'Berl. Klin. Wochnschr.,' 1890, p. 987	M 57	Carcinoma of posterior wall of pharynx	Tracheotomy and, 2 days later, subhyoid pharyngotomy	Recovered	Died of phthisis 9 months later. No recurrence.
101	Woods. 'Medical Press and Circular,' 1893	F 44	Epithelioma of posterior wall of pharynx just above right arytenoid cartilage	Tracheotomy. Subhyoid pharyngotomy and growth removed. Much blood swallowed; removed by stomach tube	Recovered	No further history.
102	Verneuil. (1886) From Krauefuss's Thesis	? ?	Carcinoma of pharynx ...	Langenbeck's incision, with resection of jaw	Death, in 4 weeks, of septic pneumonia.	

β. Sarcoma.

103	v. Bardeleben. 'Schmidt's Jahrbuch,' 1885 vol. 207	F 40	Retropharyngeal fibro-sarcoma	Lateral pharyngotomy. Incision along border of sterno-mastoid	Recovered after membranous pharyngitis and laryngitis. Sent out at end of 7 weeks	(?)
104	Verneuil. 'Progres Med.,' 1884	F 57	Sarcoma of subhyoid region reaching to left parotid region	Tracheotomy. Removal of tumour and diseased part of hyoid bone	Died of collapse. Secondary nodules found in lungs and mediastinal glands.	
105	Baum. (1875) 'Berlin Klin. Wochnschr.,' 1875. Reported by Rosenbach	M 45	Round-celled sarcoma about size of hen's egg in pharynx chiefly on right side	Tracheotomy on admission for dyspœna. Pharynx opened, tumour peeled off, and base ligatured and removed	Recovered	Recurred later. Operated on by König.
106	Langenbeck. (1873) 'Archiv f. Klin. Chirurg.,' vol. 15. Quoted from Kranefuss's Thesis	F 22	Small celled sarcoma of pharynx	Tracheotomy. Resection of jaw. Failure to remove disease	Death, on 5th day, from septic pneumonia.	

107	v. Bergmann. (1883) 'Deutsche Med. Wochnschr.,' 1883	F 18	Spindle-celled sarcoma of left great cornu of hyoid bone involving wall of pharynx; ulcerated	Division of jaw. Formation of fistula. Tracheotomy. Pharyngotomia lateralis after v. Langenbeck. Removal of piece of great cornu	Recovered	Well 5 weeks after operation.
108	Lange. 'New York Med. Journ.,' vol. 45	M ?	Sarcoma of left half of pharynx behind palate and down so far as to dislocate larynx	Tracheotomy. Ramus of jaw removed and disease scraped out	Recovered	Well 7 months later. (? Simple tumour.)

C.—Where the epiglottis was the centre of the disease.

a. Carcinoma.

109	v. Langenbeck. Keitel's Thesis, "Operationen am Pharynx und Œsophagus," 1883	M 51	Carcinoma of epiglottis, &c.	Tracheotomy. Subhyoid pharyngotomy and epiglottis removed	Died 3rd day. Double pleurisy pericarditis and mediastinitis. Some growth seen on hyoid bone and arytenoids.	
110	Israël. (1893) 'Langenbeck's Archiv f. Klin. Chirurg.,' 1895	M 64	Epithelioma of whole epiglottis and right glosso-epiglottic ligament, and in fossa between tongue and epiglottis. No glands	Tracheotomy 3 days previously. Incision along lower border of hyoid bone, and all muscles, &c., divided, except thyro-hyoids. Superior laryngeal nerves preserved. Divided thyro-hyoid ligament close to hyoid, and glosso-epiglottic folds. Epiglottis removed. Mucous membrane of tongue stitched back to divided part. Cannula changed second day, and Hahn changed for ordinary tube on third	Recovered	Four months later, glands removed from both sides of neck. Well 2 years later.
111	Von Schulten. 'VirchowHirschJahrbuch,' 1882, II., p. 368	M 54	Epithelioma of epiglottis ...	Tracheotomy, followed by bronchitis. Four weeks later subhyoid pharyngotomy (Malgaigne) and removal of greater part of epiglottis	Recovered	No recurrence after 5 months. Eight weeks after operation could swallow well, but had to wear cannula.

Group II. C.—*continued.*

α. Carcinoma—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
112	Watson Cheyne. (23/11/94)	M 60	Epithelioma of base of tongue and epiglottis chiefly on left side. Glands in anterior triangle	Tracheotomy. Removal of glands. Ligature of external carotid. Lateral pharyngotomy, removal of whole epiglottis and base of tongue	Recovered	Glands removed from left posterior triangle, July, 1895, and from right anterior triangle, December, 1895. Well 15 months after operation. Excellent functional result. (Patient still well, May, 1896.)

β. Sarcoma.

113	Burow. 'Berl. Klin. Woehnsehr.,' 1877	M 30	Sarcoma of epiglottis removed with snare 1874. Four months later recurrence, forming ulcerated tumour in site of epiglottis obstructing respiration. No glands	Tracheotomy for dyspnœa. Six days later, removal by snare, but part left. Ten days later, subhyoid pharyngotomy part cut off and rest scraped	Recovered	Well 1½ years later.
114	Albert. (1877) 'Wiener Med. Presse,' vol. 19	F 64	Sarcoma of left arytenoid extending on to epiglottis	No tracheotomy. Subhyoid pharyngotomy and removal of arytenoid and affected part of epiglottis	Recovered	Well a year later.

Group III.—Cases where the disease involved both Pharynx and Larynx.

a. Carcinoma.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
115	v. Langenbeck. (1878) 'Archiv f. Klin. Chirurg.,' vol. 24	M 48	Carcinoma of right side of pharynx, involving right half of thyroid cartilage, right ary-epiglottic fold, and tip of arytenoid cartilage; glands	Tracheotomy. Pharynx opened from side. Tumour and part of thyroid cartilage and arytenoid removed. Superior laryngeal nerve divided	Death, 3 days later, of septic pneumonia.	
116	v. Langenbeck. (1878) 'Archiv f. Klin. Chirurg.,' vol. 24	M 78	Epithelioma of posterior wall of pharynx, coming on to lower part of thyroid cartilage	Lateral pharyngotomy. Removal of pharynx and upper part of œsophagus, piece of thyroid cartilage, and half thyroid gland	Death, a few hours after operation, from collapse.	
117	v. Langenbeck. 'Archiv f. Klin. Chirurg.,' 1879	F 52	Carcinoma of right half of pharynx and right arytenoid cartilage	Tracheotomy and lateral pharyngotomy. Removal of affected part of pharynx, right arytenoid cartilage, and posterior part of right vocal cord	Died, in 13 days, of septic pneumonia.	
118	Thiersch. From Iversen's paper, 'Archiv f. Klin. Chirurg.,' vol. 31	F 45	Carcinoma of pharynx at lower part and all round œsophagus and affecting larynx	Resection of pharynx, œsophagus, and larynx	Recovered	Died, 4 months later, of local recurrence.
119	Thiersch. From Iversen	F 57	Carcinoma of pharynx spreading on to both arytenoid cartilages, down to œsophagus, and involving thyroid gland	Removal of pharynx, larynx, and œsophagus to 2½ cm. below manubrium sterni	Death, 7 days later, from septic pneumonia.	

Group III. α. *Carcinoma*—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
120	Iversen. 'Archiv f. Klin. Chirurg.,' vol. 31	F 44	Epithelioma surrounding lower part of pharynx and entrance of œsophagus, affecting posterior part of larynx	Tracheotomy. Subhyoid pharyngotomy. Removal of larynx and upper part of œsophagus	Recovered	No recurrence after 11 months. Functional result good, but contraction at entrance of œsophagus so great that introduction of œsophageal tube blocked trachea. Attempt to remedy this led to patient's death in 8 days from septicæmia.
121	Iversen. 'Archiv f. Klin. Chirurg.,' vol. 31	F 48	Carcinoma of pharynx and œsophagus, paralysis of vocal cords and affection of larynx	Tracheotomy. Removal of larynx, pharynx, and upper part of œsophagus	Recovered	Well 5 months later.
122	Iversen. 'Journal of Laryngology,' 1888	F 49	Epithelioma of lower part of pharynx and upper part of œsophagus	Excision of larynx, pharynx, upper part of œsophagus, and left lobe of thyroid	Died on 37th day of broncho-pneumonia and abscess in lung.	
123	Iversen. 'Journal of Laryngology'	F 27	Epithelioma of posterior surface of cricoid, lower part of pharynx and upper part of œsophagus	Removal of larynx, pharynx, upper part of œsophagus, and right lobe of thyroid	Died, 30 hours later, of collapse.	
124	Iversen. 'Journal of Laryngology'	F 46	Epithelioma of right arytenoid and ary-epiglottic fold, and of pharynx down to œsophagus	Removed incompletely ...	Died, 8th day. (? Iodoform ? septicæmia.)	
125	Iversen. 'Journal of Laryngology'	F 34	Epithelioma of epiglottis extending down to lower part of pharynx	Removal of pharynx, larynx, epiglottis, and left lobe of thyroid	Recovered	Well 14 months later.

126	Marcacci. From Bosworth's "Diseases of the Throat and Nose"	F 20	Epithelioma of lower part of pharynx and upper part of œsophagus. Larynx also involved	Subhyoid pharyngotomy (?)	Death in 4 days.	
127	Watson Cheyne. (1/8/92) (*See* paper)	M 40	Epithelioma of right side of pharynx, right ary-epiglottic fold and epiglottis. Mass adherent to thyroid cartilage	Tracheotomy. Lateral pharyngotomy. Removal of disease and half the epiglottis. Rest of larynx left intact. Rest of epiglottis removed next day	Died, of septic pneumonia, on 4th day.	
128	McLeod. (1891) 'Indian Med. Gazette,' 1891	M 38	Malignant disease of left half of larynx, epiglottis, and arytenoids. Glands	Extirpation of whole larynx, anterior wall of pharynx, and glands	Recovered	No further history.
129	Lack. (1894) Not published	F 54	Epithelioma of right arytenoid and adjacent parts	Tracheotomy, lateral pharyngotomy, and excision of affected parts	Died, on 8th day, of exhaustion partly due to hæmorrhage.	
130	Bull. (1888) 'Med. Record,' 1895	M 51	Epithelioma of right side of larynx, epiglottis, and neighbourhood. Glands	Tracheotomy. 11 days later removal of half the larynx, epiglottis, and part of pharynx	Recovered	Died of recurrence in 14 months.
131	Stimson. (1892) 'Med. Record,' 1895	M 36	Carcinoma of larynx and œsophagus	Removal of part of larynx and œsophagus	Died in 36 hours.	
132	Branham. (1887) 'Med. Record,' 1895	M ?	Carcinoma (?)	Removal of larynx and pharynx	Died, on 4th day, of pneumonia.	
133	Roux. (1887) 'Med. Record,' 1895	F 61	Carcinoma (?)	Removal of larynx, pharynx, and glands	Recovered	Recurred in 4 months.
134	Billroth. (1879) 'Archiv f. Klin. Chirurg.,' vol. 31	F 43	Carcinoma of larynx and pharynx	Removal of whole larynx, thyroid gland, and part of pharynx	Died, 5 weeks later, from œsophageal tube passing into mediastinum.	
135	MacEwen. (1879) Tauber 26 in 'Archiv f. Klin. Chirurg.,' vol. 41	M 56	Carcinoma of larynx and pharynx. Glands	Removal of whole larynx, upper part of pharynx, and glands	Died, on 3rd day, of pneumonia.	
136	Bircher. (1880) Tauber, 41	F 49	Scirrhus of thyroid gland and larynx. Partial laryngectomy, and recurrence in 6 months	Removal of whole larynx and part of pharynx	Died, 16th day, of pneumonia and gangrene of lung.	

Group III. *a. Carcinoma*—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation	Immediate result.	Ultimate result.
137	Albert. (1881) Tauber, 54	M 45	Carcinoma of larynx, filling up nearly half the lumen	Removal of whole larynx, except epiglottis and part of œsophagus	Died, 8th day, bleeding from internal carotid ligature; collapse.	
138	Margary. (1881) Tauber, 56	F 36	Epithelioma, larynx and œsophagus	Removal of whole larynx and first tracheal ring, part of pharynx and œsophagus	Recovered	Recurred in 3 months, and died of bleeding in 6 months.
139	Reyher. (1882) Tauber, 64	M 55	Carcinoma, larynx and pharynx	Removal of whole larynx and part of œsophagus	Died, 14th day, of inanition.	
140	Holmer. (1882) Tauber, 69	M 63	Epithelioma of larynx and pharynx	Removal of whole larynx and part of pharynx	Died, 4th day.	
141	Von Winiwarter. (1882) Tauber, 76	M 50	Carcinoma of larynx, pharynx, and glands	Removal of whole larynx, part of pharynx and glands, with internal jugular vein	Died, 9th week, inanition.	
142	Novaro. (1883) Tauber, 87	M 54	Carcinoma of larynx, pharynx, and thyroid gland	Removal of whole larynx, thyroid gland, and part of pharynx	Died, 1 month, croupous pneumonia.	
143	Thos. Jones. (1884) Tauber, 94	M 44	Epithelioma of larynx and pharynx	Removal of whole larynx, part of pharynx, and first tracheal ring	Recovered	Recurred in lymphatic glands.
144	Hahn. (1884) Tauber, 101	F 52	Carcinoma of œsophagus and larynx	Removal of whole larynx, anterior wall of pharynx, and œsophagus	Recovery	Rapid recurrence and death in 2 or 3 months.
145	Jawdynsky. (1885) Tauber, 112	F 63	Carcinoma, larynx and pharynx	Removal of whole larynx and part of pharynx	Recovery	Died of recurrence in 10 months.

146	Pèan. (1886) Tauber, 119	M 65	Epithelioma, larynx and pharynx	Removal of whole larynx, part of epiglottis, and anterior wall of pharynx	Died, pneumonia.	
147	Pèan. (1894) 'Archiv Internat.deLaryngol.', 1895	M 50	Epithelioma of larynx, epiglottis, pharynx, œsophagus and trachea	Tracheotomy. Removal of whole larynx, part of pharynx, and œsophagus	Recovered	Well 2 months later.
148	Dupont. (1886) Tauber, 127	M 52	Carcinoma of larynx, epiglottis, and glands	Removal of whole larynx, epiglottis, and part of œsophagus	Recovered	Died 14 months later. (? Cause.)
149	Agnew. Tauber, 134	M 58	Carcinoma of larynx and glands	Removal of whole larynx, and part of anterior wall of pharynx	Died, 3rd day.	
150	Rushton Parker. (1887) Tauber, 147	M 39	Carcinoma of larynx and pharynx recurring after two previous partial operations	Total extirpation of larynx, part of pharynx and tonsils	Recovered	Recurred in 9 weeks, followed by death.
151	Kocher. (1882) 'Langenbeck's Archiv,' vol. 44	M 54	Carcinoma left ventricular band, arytenoid, ary-epiglottic fold, left side of pharynx and glands	Total extirpation of larynx, part of pharynx and glands	Recovered	No recurrence in 4 months. Died in 14 months, cause unknown.
152	Kocher. (1882) 'Langenbeck's Archiv,' vol. 44	M 43	Carcinoma, larynx and pharynx	Total extirpation of larynx, and part of œsophagus	Recovered	Recurred in 6 months.
153	Kocher. (1889) 'Langenbeck's Archiv,' vol. 44	M 53	Epithelioma, larynx and glands, &c.	Total extirpation of larynx, resection of pharynx and œsophagus	Died, 5th day, collapse and accumulation of mucus.	
154	Kocher. (1890) 'Langenbeck's Archiv,' vol. 44	M 58	Diffuse growth upper part of larynx, tongue, and glands	Removal of tongue, floor of mouth, hyoid bone, part of pharynx, thyroid cartilage, and lower jaw	Recovered	Recurrence in 11 months.
155	v. Langenbeck. (1875) No. 8 in Wassermann's Statistics, 'Deutsche Zeit. f. Chirurgie,' 1889	M 57	Carcinoma of larynx, epiglottis, and hyoid bone	Removal of the whole larynx, epiglottis, part of tongue, pharynx, and œsophagus	Recovered	Died of recurrence 4 months after operation.
156	Bottini. (1877) No. 15, Wassermann	M 48	Epithelioma of larynx, &c....	Total extirpation of larynx, and part of œsophagus	Died, 3 days later, pneumonia.	

GROUP III. *a. Carcinoma*—continued.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
157	Thiersch. (1880) Wassermann	M 36	Carcinoma of larynx, &c. ...	Total extirpation of larynx, and part of œsophagus	Recovered	Died, 3½ years later, of recurrence.
158	McLeod (Calcutta). (1883) Wassermann	M 40	Epithelioma of larynx, &c....	Total extirpation of larynx, epiglottis, part of pharynx, and glands	Died, 5th day, hæmorrhage, commencing pneumonia.	
159	Landerer. (1883) Wassermann	M 47	Carcinoma of larynx and pharynx	Total extirpation of larynx and left side of œsophagus	Died, 4th day, collapse.	
160	Krönlein. (1886) Wassermann	F 38	Carcinoma of larynx, &c. ...	Total extirpation of larynx, and part of the œsophagus	Recovered	Died, 13 months later, of recurrence.
161	Novaro. (1887) Wassermann	M 72	Carcinoma of pharynx and larynx	Total extirpation of larynx, and part of pharynx	Recovered	Died of recurrence 9 months later.
162	Riegner. (1888) Wassermann	M 60	Carcinoma of larynx, &c. ...	Total extirpation of larynx, and part of trachea and œsophagus	Died, 4 weeks later, pneumonia.	
163	Billroth. (1881) Wassermann	M 65	Carcinoma of larynx, &c. ...	Removal of right half of larynx and part of pharynx	Died, 6 weeks later, of Sepsis, recurrence.	
164	Billroth. (1884) Wassermann	M 58	Carcinoma of larynx and pharynx	Removal of right half of larynx, part of pharynx, glands, and greater part of epiglottis	... ...	Recurrence 2 months later.
165	Billroth. (1884) Wassermann	M 46	Carcinoma of larynx and pharynx	Removal of right half of larynx, part of pharynx, epiglottis, and glands	Recovered.	
166	Socin. (1887) Wassermann	F 55	Epithelioma of larynx ...	Removal of right half of larynx, epiglottis, half the hyoid bone, and part of the pharynx	Recovered	No recurrence 10 months later.

167	Demous. (1887) Wassermann	M 44	Epithelioma of epiglottis and tongue	Removal of the upper two-thirds of thyroid cartilage, part of the pharynx and tongue	Recovered	Recurrence 9 months later.
168	Krönlein. (1887) Wassermann	M ?	Carcinoma of larynx... ...	Removal of half the larynx, part of epiglottis, and pharynx	Died, 17 days later, of pneumonia.	
169	Küster. (1888) Wassermann	M 52	Carcinoma of larynx. Glands	Removal of right half of larynx and part of pharynx	Died, 19th day, putrid bronchitis.	

β. Sarcoma.

170	Caselli. (1879) Tauber 27 in 'Archiv f. Klin. Chirurg.,' vol. 41	F 19	Sarcoma of pharynx, larynx, and base of tongue	Removal of whole larynx, upper part of pharynx, and glands	Died, on 3rd day of pneumonia.	
171	Lange. (1879) Tauber, 28	M 74	Sarcoma of larynx and part of pharynx	Removal of whole larynx, right cornu of hyoid, and part of œsophagus	Recovered	Died of recurrence 7 months later.
172	MacLeod. (1883) Tauber, 86	M 54	Sarcoma of pharynx, larynx, &c.	Removal of whole larynx, part of pharynx, thyroid, and lymphatic glands	Died on 5th day of hæmorrhage.	

ADDENDUM.

Three cases of Nasal and Naso-pharyngeal Tumours.

No. of case.	Operator and reference, and year of operation.	Sex and age.	Disease and parts involved.	Nature of operation.	Immediate result.	Ultimate result.
1	Watson Cheyne. (3/3/92)	M 46	Sarcoma growing from base of skull, coming down left side of naso-pharynx, blocking eustachian tube, affecting upper part of soft palate. Glands in neck	Tracheotomy. Removal of glands, excision of left upper jaw and pterygoid process. Removal of tumour. Cauterisation of bone	Recovered	Recurrence in nose 15 months later. Growth cleared out but recurred there and in glands. Died 2¾ years after operation.
2	Watson Cheyne. (7/3/94)	F 45	Spindle-celled sarcoma growing from roof of nasal cavity and naso-pharynx, bulging the right eye outward and forward, destroying nasal bones and septum	Incision on right side of nose from forehead to nostril. Removal of tumour	Recovered	Well a year later.
3	Watson Cheyne. (22/12/95)	F 24	Lympho-sarcoma growing from base of skull and projecting into naso-pharynx	Soft and hard palate split, piece of hard palate and vomer removed, and tumour peeled off from bone. Nitric acid applied.	Recovered.	

The only larger statistics which, so far as I know, I have omitted, are 12 cases by Kronlein, with 3 deaths. These have not, so far as I can find, however, been published, with the exception of two, one of which was well at the end of 7 years. To include this one and not the others would vitiate the statistics. I have also come across references to the following cases, but have not been able to find full details, and probably they are not published in detail, viz.:—*Marchaud*—Partial extirpation of the pharynx; died of pneumonia on 7th day. *Trelat*—Cancer of tonsil and pillars of fauces; recovered. *Verneuil* (mentioned by Castex)—Epithelioma of tonsil, soft palate, pharynx, tongue and floor of mouth; died of glycosuria. *Labbe*—Epithelioma of tonsil, soft palate, pharynx, tongue and floor of mouth; recovered (? recurred). *Hueter*—Sarcoma of tonsil; death in 3 weeks, from pneumonia. *Hahn*—Removal of epiglottis; recurrence in 3 months (referred to by Schötz in 'Centralblatt f. Laryngologie,' No. 6). *Fischer* (referred to by Keitel)—Tumour of whole posterior wall of pharynx; recovered. *König*—3 cases (referred to by Keitel): Recurrent carcinoma of posterior wall of pharynx; recovered. Carcinoma of tonsil extending on to pharynx; died of septic pneumonia. Carcinoma of tonsil; died of septic pneumonia. *Billroth*—Lympho-sarcoma of tonsil, very extensive, vagus divided; death from œdema of the lungs. *Bergmann* refers ('Deutsche Med. Wochen.,' 1883) to a case where he removed a large piece of the lower jaw, tonsil, and almost the whole of one side of the pharynx, but does not state result. *Gallardo*—Extirpation of cancerous tumour of palate and tonsil in a male æt. 40; rapid recurrence in glands in one month.

Total Results.

[D = died. C = no recurrence for 3 years. R = recurred soon, and inoperable. H = healed, and well at last note more than 6 months after operation. H? = healed, but no note later than 6 months after operation. R (good) = a long interval before recurrence. R(H) = recurred, operated and healed. R(H?) = recurred, operated and healed, but no further notes.]

Group I.—Cases where the disease was removed from the mouth, with or without splitting the cheek, and with or without tracheotomy; where, in fact, there was no wound in the neck communicating with the mouth—

a. Carcinomata, 13 cases—2 D, 4 H?, 1 R (good), 3 H, 3 C.
β. Sarcomata, 10 cases—5 R, 3 R (good), 2 R(H).

Total, 23 cases—2 D, 4 H?, 5 R, 4 R (good), 2 R(H), 3 H, 3 C.
Mortality, 8·6%; no benefit, 30%; benefit, 25%; cured, 13%.

Group II.—Cases of disease in the pharynx where the internal wound communicated with a wound in the neck—

A. Where the disease was situated in or in the vicinity of the tonsils, and extended from thence to the neighbouring parts.

1. Where the jaw was not divided—

a. No tracheotomy.

α. Carcinomata, 6 cases—2 D, 2 R, 1 R(H?), 1 H.
β. Sarcomata, 5 cases—2 H?, 1 R, 1 R(H), 1 H.

Total, 11 cases—2 D, 2 H?, 3 R, 1 R(H?), 1 R(H), 2 H.

b. Tracheotomy.

α. Carcinomata, 9 cases—5 D, 1 H?, 3 R.

Total where jaw was not divided—

α. Carcinomata, 15 cases—7 D, 1 H?, 5 R, 1 R(H?), 1 H.
β. Sarcomata, 5 cases—2 H?, 1 R, 1 R(H), 1 H.

Total, 20 cases—7 D, 3 H?, 6 R, 1 R(H), 1 R(H?), 2 H.
Mortality, 35%; no benefit, 65%; benefit, 15%.

2. Where the jaw was divided—

a No tracheotomy.

α. Carcinomata, 20 cases—4 D, 7 H ?, 7 R, 1 R (good), 1 H.

β. Sarcomata, 5 cases—1 D, 1 R, 1 R(H ?), 2 H.

Total, 25 cases—5 D, 7 H ?, 8 R, 1 R(H ?), 1 R (good), 3 H.

b. Tracheotomy.

α. Carcinomata, 16 cases—5 D, 3 H ?, 4 R, 2 R(H ?), 1 R(C), 1 H.

β. Sarcomata, 9 cases—3 D, 3 H ?, 2 R, 1 H.

Total, 25 cases—8 D, 6 H ?, 6 R, 2 R(H ?), 1 R(C), 2 H.

Total where jaw was divided—

α. Carcinomata, 36 cases—9 D, 10 H ?, 11 R, 2 R(H ?), 1 R (good), 1 R(C), 2 H.

β. Sarcomata, 14 cases—4 D, 3 H ?, 3 R, 1 R(H ?), 3 H.

Total, 50 cases—13 D, 13 H ?, 14 R, 3 R(H ?), 1 R (good), 1 R(C), 5 H.

Mortality, 26°/₀; no benefit, 54°/₀; benefit, 14°/₀.

Mortality where no tracheotomy=19°/₀; where tracheotomy=38°/₀.

Total results of Group II., A.—

α. Carcinomata, 51 cases—16 D, 11 H ?, 16 R, 3 R(H ?), 1 R (good), 1 R(C), 3 H.

β. Sarcomata, 19 cases—4 D, 5 H ?, 4 R, 1 R(H ?), 1 R(H,) 4 H.

Total, 70 cases—20 D, 16 H ?, 20 R, 4 R(H ?), 1 R(H), 1 R (good), 1 R(C), 7 H.

Mortality, 28°/₀; no benefit, 57°/₀; benefit, 14°/₀.

B. Where the pharyngeal disease was at a lower level than the tonsillar region, or at any rate did not involve it.

α. Carcinomata, 9 cases—4 D, 3 R, 1 H ?, 1 H.

β. Sarcomata, 6 cases—2 D, 2 H ?, 1 R(H ?), 1 H.

Total, 15 cases—6 D, 3 R, 3 H ?, 1 R(H), 2 H.

C. Where the epiglottis was the centre of the disease.

α. Carcinomata, 4 cases—1 D, 1 H ?, 2 R (good).

β. Sarcomata, 2 cases—2 H.

Total, 6 cases—1 D, 1 H ?, 2 R (good), 2 H.

Total result of Group II.—

α. Carcinomata, 64 cases—21 D, 13 H ?, 19 R, 3 R(H ?), 3 R (good), 1 R(C), 4 H.

Mortality, 32°/₀; no benefit, 62°/₀; benefit, 12°/₀.

β. Sarcomata, 27 cases—6 D, 7 H ?, 4 R, 2 R(H ?), 1 R(H), 7 H.

Mortality, 22°/₀; no benefit, 37°/₀; benefit, 29°/₀.

Total, 91 cases—27 D, 20 H ?, 23 R, 5 R(H ?), 3 R (good), 1 R(H), 1 R(C), 11 H.

Mortality, 29°/₀; no benefit, 54°/₀; benefit, 17°/₀.

GROUP III.—Where the disease involved both pharynx and larynx—

α. Carcinomata, 55 cases—30 D, 4 H ?, 14 R, 2 R (good), 1 H, 4 H (died without recurrence).

β. Sarcomata, 3 cases—2 D, 1 R.

Total, 58 cases—32 D, 4 H ?, 15 R, 2 R (good), 1 H, 4 H (died, well).

Mortality, 55°/₀; no benefit, 81°/₀; benefit, 12°/₀.

	Mortality.	No benefit.	Benefit.
Group I.	8·6°/₀	30°/₀	52°/₀
Group II.	29°/₀ . ..	54°/₀	17°/₀
Group III.	55°/₀	81°/₀	12°/₀

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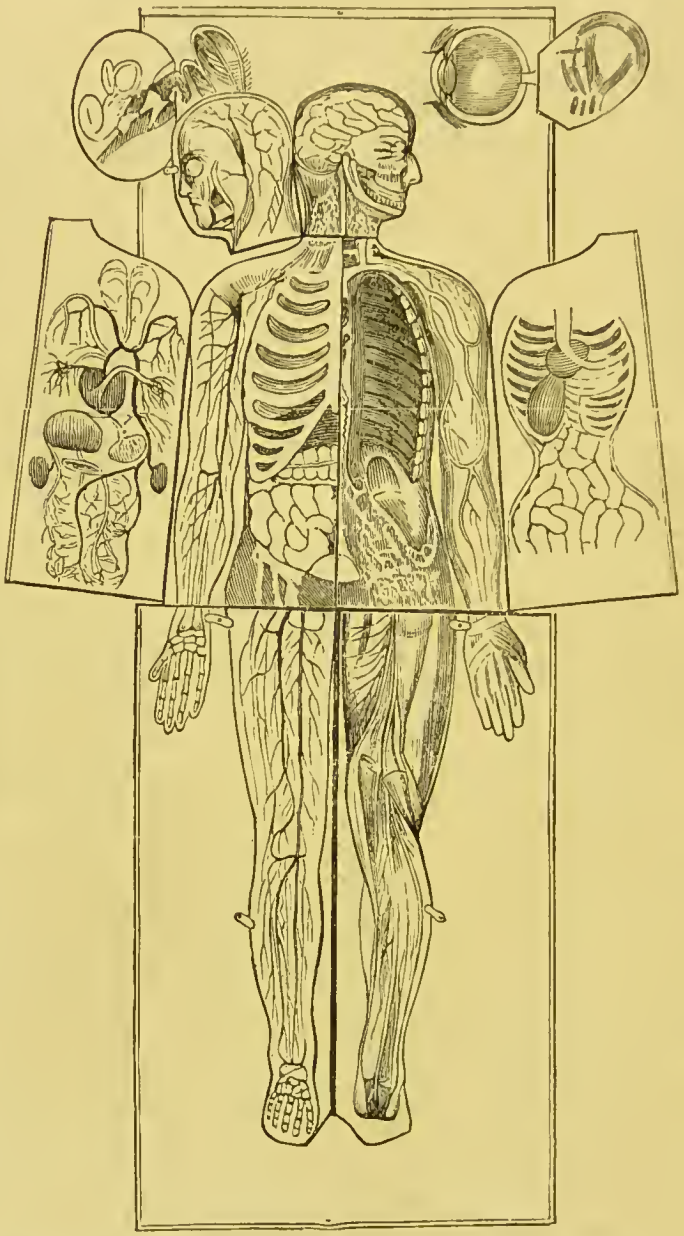

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